DAMES & MOORE

FINDINGS OF AN INVESTIGATION TO ACHIEVE FINAL CLOSURE OF THE INTERIM TSD FACILITY LOCATED AT THE MODINE HEAT TRANSFER, INC. SITE CAMDENTON, MISSOURI

Prepared For
MODINE MANUFACTURING COMPANY

DAMES & MOORE

Springfield, Missouri

Dames & Moore Job No. 27397-005-045
February 12, 1996

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

Modine Manufacturing Company (Modine) is submitting this report presenting the findings from work conducted in accordance with the "Work Plan Modification for an Investigation to Achieve Final Closure of the Interim TSD Facility at the Modine Heat Transfer, Inc. Site Camdenton, Missouri" (Work Plan). The revised Work Plan was submitted to the Missouri Department of Natural Resources (MoDNR) on June 1, 1995.

Based on the past site activities, findings of past investigations, and requirements of the state of Missouri, Dames & Moore, Inc. (Dames & Moore) conducted a soil and groundwater investigation. This investigation included: advancement of six soil borings, installation of two monitoring wells, collection of soil and groundwater samples, and removal of the impacted soil in the area of elevated lead concentrations. The purpose of this investigation was to further define the extent of contamination, identify the impact to groundwater, and attempt to obtain sufficient data to achieve final closure of the Resource Conservation and Recovery Act (RCRA) regulated interim treatment, storage, or disposal (TSD) facility at the Modine Heat Transfer, Inc. site in Camdenton, Missouri.

2.0 BACKGROUND INFORMATION

2.1 Site Location and Operations

The Modine Heat Transfer, Inc. site is located on Sunset Drive in Camdenton, Missouri. The site occupies approximately 100 acres in Section 26, Township 38 North, Range 17 West in Camden County (Figure 1). The one manufacturing plant at the site occupies approximately 120,000 square feet and has undergone four construction additions through its history (1971, 1973, 1979, and 1983).

Operations began at the site in 1967 under the ownership of Dawson Metal Products. Sundstrand Heat Transfer Products (Sundstrand) purchased the site in 1972 and operated it until 1990. Modine Heat Transfer, Inc., a wholly owned subsidiary of Modine Manufacturing Company, purchased the site in October 1990. The site has always been utilized in the manufacture of aluminum and copper coils and feeder parts used in the manufacture of heat transfer products.

2.2 Regulatory History and Previous Site Investigations

A Resource Conservation and Recovery Act (RCRA) Part A Permit application to operate a storage facility was submitted by the former owners of the facility (Sundstrand) to the U.S. Environmental Protection Agency (USEPA) in November 1980. A RCRA Part B Permit application has never been filed; therefore, the facility has been operating as a treatment, storage, or disposal (TSD) facility under interim status.

Prior to purchase of the site by Modine, Sundstrand submitted a Closure Plan in September 1990 to terminate its interim status and hold generator status only. The Closure Plan addressed three former storage areas, all located on the west side of the building. The three areas covered by the Closure Plan include:

- Area 1: 1980 - 1983 Drum Storage Area
- Area 2: 1983 - 1985 Tank and Drum Storage Area
- Area 3: 1985 - 1990 Tank and Drum Storage Area

In response to unrelated allegations of a release of spent solvent filed with MoDNR, Modine conducted an Environmental Site Assessment (ESA) at the facility in November 1991. At the time of the investigation the area of the suspected release housed the monorail degreaser and associated containment pit. Soil samples were taken and the results indicated generally low (less than 1 part per million (ppm)) volatile organic compound (VOC) concentrations with the exception of 1,1,1-Trichloroethane (TCA) and Trichloroethene (TCE) detected at higher concentrations.

Due to the constituents identified during the ESA, MoDNR conducted a site inspection in July 1992 that included installation of the two on-site monitoring wells. Based upon the results of this investigation the Superfund Section of the MoDNR Hazardous Waste Program concluded that no further action was necessary.

A spill of TCA occurred in early 1992 from a monorail degreaser in the plant (same area investigated in ESA 11/91). It was estimated that after recovery, there was a loss of approximately 206-gallons of solvent, which was primarily attributable to volatilization of the solvent.

Approval of the closure plan with modifications was granted by MoDNR in November 1992. Subsequent negotiations regarding the modifications resulted in an agreement being reached in March 1993. The Closure Plan modifications included collection of soil samples and wipe samples. The results of an investigation conducted in July 1993, indicated VOC concentrations of less than 0.1 ppm in all soil samples collected and one elevated lead concentration of 1,400 ppm in boring B-11 adjacent to Area 2. Based upon these results; final closure of the TSD facility was not granted by MoDNR in March 1994. Rather than do excessive excavation and investigation Modine requested to demonstrate a risk-based closure. An environmental risk assessment (risk assessment analysis of the soil) was conducted in August of 1994 to assess the potential impacts on human health from the soil. The results indicated the following: no health risk was posed by the minimal amounts of VOCs in the soil, and that lead in soil was not considered a significant risk based constituent. The Assessment concluded that further soil remediation was not necessary based upon risk. Following completion of the risk assessment, Modine was notified by MoDNR that the assessment did not fulfill the closure requirements with regard to the groundwater issue.

MoDNR conducted a RCRA sampling investigation on December 7, 1994. The purpose of the investigation was to sample the two on-site monitoring wells. Analytical results indicated that there was TCE detected at concentrations ranging from below 5 parts per billion (ppb) to 6.9 ppb.

Another round of sampling of the two on-site monitoring wells was conducted on February 23, 1995, by Modine. The results from this sampling event indicated no TCE concentrations at detectable levels above 5 ppb.

3.0 SITE ENVIRONMENT

The site is located on an east to west trending small ridgetop on the Salem Plateau, a subprovince of the Ozark Province. Ground surface at the site is mildly sloping to the south and west to steeply sloping to the south on the southern portion of the site. Topographic relief across the majority of the site is approximately 20 feet. Elevation at the plant is approximately 960 feet above mean sea level (msl).

3.1 Soil

The predominant soil at the site is classified as the Lebanon silt loam by the U.S. Soil Conservation Service (SCS). This soil is a gently sloping (2 to 5 percent slopes), moderately well drained soil that typically forms on ridgetops. The surface layer is typically dark brown silt loam approximately 6 inches thick. The 17 inch thick subsoil, present above a fragipan, is composed of brown silty clay loam to gray-brown mottled silty clay. The fragipan is about 14 inches thick and consists of a very dense brown-gray mottled extremely cherty silt loam. Beneath the fragipan, and extending to bedrock, is a red-brown mottled very cherty to cherty clay. Permeability in the Lebanon soil is characterized as slow (0.06 to 0.2 inches per hour (in/hr)) to very slow (less than 0.06 in/hr).

Other soil types present at the site, primarily on the south and far west sides, include the Doniphan very cherty silt loam and the Niangua-Bradley very cherty silt loam. Permeability in these soil types are moderate (0.6 to 2.0 in/hr) to moderately slow (0.2 to 0.6 in/hr), with the exception of the top one foot of the Doniphan where permeability is moderately rapid (2.0 to 6.0 in/hr).

The soil types encountered during this investigation include a red to brown clay with chert fragments and in some areas a grey clay with chert gravel in red clay. A distinct fragipan was not encountered in any of the borings. This residuum soil is reported (Whitfield) to contain as much as 5 to 15 percent chert and sandstone fragments.

3.2 Geology

The bedrock unit lying directly below the soil at the site is a cherty dolomite of the Ordovician age Roubidoux Formation. The Roubidoux Formation is generally 130 to 150 feet thick and consists of cherty dolomite, chert, and sandstone. The formation has entire layers of hard, brittle chert. In Camden County the Roubidoux has less sandstone than in counties further south. Beneath the Roubidoux is the Ordovician age Gasconade Dolomite 290 to 330 feet thick (which includes the 15 to 20 feet thick Gunter Sandstone Member at its base), the Cambrian age Eminence Dolomite 300 to 350 feet thick, and underlying the Eminence Dolomite are Precambrian granites and gneiss.

Based upon the results of this investigation it appears that competent bedrock was encountered at the site at depths ranging from approximately 32.5 feet below ground surface (bgs) in MW-4 to 55 feet bgs in MW-3. The results of this and previous investigations indicate that when drilling with a hollow stem auger, refusal was encountered at depths ranging from 4.5 feet to 13 feet bgs. We believe that the refusal was at the encounter of chert nodules and remnant rock fragments.

3.3 Hydrogeology

The occurrence of perched water tables in the Lebanon silt loam are common during the winter and spring months. The perched water tables occur at the fragipan in some areas and at the soil/rock interface in most areas. Groundwater at the soil/rock interface is of insufficient volume and duration to yield amounts viable for domestic use. No perched groundwater was encountered during the advancement of the two groundwater monitoring wells installed as part of this investigation.

The existing monitoring wells at the site exhibited static water levels ranging from approximately 140 to 150 feet bgs in MW-1 and approximately 150 to 175 feet bgs in MW-2. The wells were completed to total depths of 161 feet bgs and 197 feet bgs for MW-1 and MW-2, respectively. The newly installed monitoring wells at the site had reported static water levels ranging from approximately 147 to 149 feet bgs in MW-3 and approximately 149 to 150 feet bgs in MW-4. The newly installed wells were completed to total depths of 167 feet bgs at MW-3 and 158 feet bgs at MW-4. In all wells the groundwater zone being monitored is reportedly the first encountered groundwater within bedrock. The wells are completed in the base of the Roubidoux Formation or the top of the Gasconade Dolomite.

A literature search revealed that Hahatonka Springs located approximately 2.5 miles south of the Modine facility is situated near a northwest trending fault zone. Information indicates that springs in the Niangua river basin appear roughly along this fault line. As stated by Vineyard in *Springs of Missouri*, "These fault zones may represent preferred directions of jointing along which the principal solution channels are developed." He goes on to indicate that these main solution channels may connect with a set of smaller channels which would intersect at right angles with the main channel. Evidence of this channeling network is illustrated in the stream alignment

in this area in which main streams tend to exhibit a northwest trend and smaller streams complete a crude rectangular network.

4.0 WORK PERFORMED

The field work was conducted at the Subject Property in August 1995 and November 1995. A project specific Health and Safety Plan was developed for Dames & Moore personnel and a health and safety briefing was held prior to initiation of the work.

4.1 Excavation of Lead Impacted Soil

A lead impacted area was identified in the area of boring B-11 during a follow-up investigation conducted by Law Environmental in July, 1993. Lead is not identified as a constituent previously stored at the facility, however, MoDNR requested that the issue of elevated lead concentrations be addressed. Due to the shallowness of the elevated lead concentration (0 to 2 feet bgs), excavation and disposal of the impacted soil near B-11 was the most efficient way to resolve the issue.

Prior to excavating the impacted area a composite sample was collected from 0 to 3 feet bgs. The sample was analyzed for Toxicity Characteristic Leaching Procedure (TCLP) Metals and Corrosivity to determine if the soil was characteristically hazardous. The results of the tests indicated that the soil was not characteristically hazardous and as such could be disposed as Special Waste. A Paint Filter test also was run on the soil to assess the amount of free liquids for disposal profiling. No free liquids were present.

Dames & Moore contracted Sunbelt Environmental Services, Inc. (Sunbelt) to perform the excavation activities. The activities began with the removal of soil to a depth of approximately four feet and an areal extent of approximately three feet in all directions from B-11. Once the soil was removed a sample was collected from the base and all four walls. The samples were analyzed for total lead concentrations by EPA Method 6010. The excavation pit remained open pending receipt of the analytical results, then the excavation was backfilled with one-inch base rock. The analytical results for the excavated soil are discussed in Section 5.0 of this report.

Approximately 12 cubic yards of soil were removed from the impacted area. The soil was hauled for disposal by Sunbelt to the Laidlaw Waste System, Inc. (Laidlaw) operated landfill in Jefferson City, Missouri.

4.2 Soil Boring Advancement and Soil Sampling

The purpose of the advancement and sampling of soil borings was to assess the rate and extent of the VOC contamination previously identified. The MoDNR Hazardous Waste Program (HWP) requires the determination of rate and extent for proper closure of all TSD facilities.

4.2.1 Soil Boring Advancement

Layne-Western Company, Inc. was subcontracted by Dames & Moore for drilling services. Personnel from their Kansas City office conducted the advancement of the soil borings using a truck-mounted hollow stem auger drilling rig. A total of six soil borings were advanced at the facility. The soil boring locations were surveyed horizontally for accurate placement by a registered land surveyor contracted by Dames & Moore and the locations are shown on Figure 2.

4.2.2 Soil Sampling

Soil samples were continuously collected from all borings with a stainless steel split spoon sampler two feet in length. The sampler was advanced ahead of the augers with a hydraulic hammer. The depths of the soil borings ranged from approximately 4.5 feet to 13 feet bgs. All of the borings were advanced until auger refusal was encountered. Soil borings were logged by a Dames & Moore representative in accordance with the Unified Soil Classification System (USCS). Boring logs are presented in Appendix A.

Prior to collecting soil samples from the borings, the outer portion of each core sample was trimmed using a stainless steel knife to alleviate possible impact from the soil sampling device. Soil samples collected were split into two portions. Both portions were stored in labeled quart-sized Ziploc® plastic bags. One portion was immediately placed in an iced cooler for possible submittal to the analytical laboratory and the other portion was reduced by hand and placed in direct sunlight for five minutes prior to taking a headspace reading to approximate organic constituent concentrations in headspace vapor. A Thermo-Environmental OVM Model 580-B

photoionization detector (PID) was used to take the headspace readings by puncturing the plastic bag with the tip of the probe. The PID was calibrated daily to a 100 parts per million (ppm) isobutylene standard.

Soil samples submitted to the laboratory were selected for submittal based on headspace readings. The intent was to select samples exhibiting no presence of VOCs from the greatest depth at locations furthest from the potential source. Samples were submitted to the laboratory for analysis from three of the six soil borings advanced at the site. The sample depths ranged from 6 inches to 13 feet. Two of the samples submitted for analysis exhibited no presence of VOCs as had been proposed in the work plan. The third sample selected for submittal exhibited a PID reading of 787 ppm in isobutylene equivalents. The following soil samples were selected for the following suite of analyses from the soil borings:

Sample ID	Depth	Requested Analysis
B-13	8.5'-13'	VOCs -EPA Method 8010
B-16	6"-4.5'	VOCs - EPA Method 8010
B-17 (MW-3)	4.5'	VOCs - EPA Method 8010

The results of the soil analysis are presented in Table 2 and discussed in Section 5.0 of this report.

Personnel conducting the soil sampling wore clean disposable latex gloves. The iced portion of the selected sample was transferred to a properly labeled and sized glass jar and placed in an iced cooler for shipment. The soil samples selected for analysis were shipped in an iced cooler, under Chain-of-Custody documentation, by overnight delivery to ATAS, Inc. in Maryland Heights, Missouri. Chain-of-Custody documentation is presented along with analytical results is Appendix B.

4.3 Monitoring Well Installation and Groundwater Sampling

The Work Plan proposed the installation of one monitoring well in the assumed downgradient direction. The purpose of the monitoring well was to aid in the determination of groundwater flow direction and to provide an additional sampling point for chemical analysis of the groundwater. It was assumed that the well would serve as a true downgradient well from any potential on-site source and aid in assessing the extent of the observed TCE impact to groundwater.

4.3.1 Monitoring Well Installation

Layne-Western Company, Inc. was subcontracted by Dames & Moore for drilling services. Personnel from their St. Louis office conducted the installation of the monitoring wells using an air rotary drilling rig. Prior to implementation of field work , a request for a well completion variance was submitted to MoDNR to allow open-hole completion of the on-site monitoring wells. Variance number 00322 was obtained from MoDNR.

Monitoring well (MW-3) was installed in the south central portion of the subject property. The well was completed and surveyed for elevation. The water level was gauged and groundwater flow direction was determined to be in a northwesterly direction. This flow direction indicated that MW-3 was not located downgradient of the former drum storage area; therefore, an additional monitoring well (MW-4) was installed northwest of the former drum storage area.

Both wells were advanced until competent bedrock was encountered. Competent bedrock was encountered at a depth of 55 feet bgs in MW-3 and at a depth of 32.5 feet bgs in MW-4. Schedule 40 steel, five inch diameter, threaded surface casing was installed 8 to 10.5 feet into the competent bedrock. In MW-3, 64 feet of casing was installed and in MW-4, 44 feet of casing was installed. The surface casing was grouted into place with a cement/bentonite slurry containing 2% calcium chloride. Calcium chloride was added to allow for the cement to set up overnight. The well was re-entered and air drilled using a 4 and 3/4 inch diameter drill bit. The wells were completed at total depths of 167 feet (MW-3) and 158 feet (MW-4). Both of the wells were developed by air lifting. Completion information for these newly installed wells and available information on previously installed wells is presented in Table 4.

4.3.2 Groundwater Sampling

Groundwater sampling was conducted on all four of the monitoring wells after installation of MW-3 and MW-4. Prior to sampling, the wells were gauged to assess groundwater levels and determine the volume of water to be purged. The monitoring wells were purged in accordance with RCRA Ground-Water Monitoring TEGD guidelines. A minimum of three well volumes were purged or the wells were purged until they went dry. Purging was done with a disposable, polyethylene bailer at MW-1, a decontaminated stainless steel bailer at MW-2, a Grundfos® Redi-Flo2 Submersible Pump with dedicated reinforced hose at MW-3, and a 3.5 inch diameter PVC bailer was used to purge MW-4. The purged water was containerized in 55-gallon drums located at each well.

Sampling of each well was conducted with a dedicated disposable bailer and new poly-rope. The bailer was slowly lowered into the water to minimize agitation. Samples were transferred from the bailer to the sample containers in a manner as to minimize agitation and aeration. Personnel conducting the groundwater sampling wore clean disposable latex gloves. In addition to the samples collected, a duplicate sample was collected at MW-2 and an equipment blank was collected from the stainless steel bailer. The samples were shipped in an iced cooler by overnight delivery service to ATAS, Inc. for VOC analysis under proper Chain-of-Custody.

4.3.3 Quarterly Groundwater Sampling

Since 180 days were available for submittal of this report, it was decided to include a round of quarterly sampling to aid in assessment of the groundwater impact at the site. The quarterly round of sampling was conducted in November, 1995. The purging of the wells was conducted in the same manner as the initial sampling, although different equipment was used on MW-2 and MW-4. A disposable, polyethylene bailer was used to purge MW-2 and Grundfos® Redi-Flo 2 Submersible Pump with dedicated reinforced hose was used to purge MW-4.

Sampling techniques remained the same with samples being collected from all wells and a duplicate sample collected from MW-4. The samples were shipped in an iced cooler by overnight delivery service to ATAS, Inc. for VOC analysis under proper Chain-of-Custody. The results of the groundwater sampling is presented in Table 3 and discussed in Section 5.0 of this report.

Presently, quarterly sampling of the monitoring wells is scheduled to continue. Gauged water levels in all the wells were slightly lower than during the initial sampling event.

4.4 Field Quality Assurance/Quality Control

Measures were taken to reduce the possibility of cross contamination between soil borings and between sampled intervals. Prior to collecting soil samples from the borings, the outer portion of each core sample was trimmed using a stainless steel knife to alleviate possible impact from the soil sampling device. After each use, soil samplers and trimming tools were decontaminated with a laboratory-grade detergent solution (Alconox®) wash and a tap water rinse. Augers were decontaminated with a high pressure hot water wash prior to the start of drilling activities. A decontaminated auger was used for the advancement of each hole. Personnel who handled tools and collected samples wore a new pair of disposable surgical gloves for each sample acquisition.

Prior to beginning the air drilling activities, the drill bit, drill rods, and back of the drilling rig were decontaminated with a high pressure hot water wash. The casing pipe also was decontaminated with a high pressure hot water wash prior to placing it into the well. The decontamination procedures were conducted in a low lying level area on the southwest edge of the paved area in the gravel. The area was of sufficient size to contain two rounds of decontamination. A large round trough was used to contain the water.

4.5 Waste Handling and Site Restoration

Investigation-derived waste was segregated according to waste type. The soil cuttings from the soil borings and monitoring wells were stored in open top 55-gallon steel drums. The soil cuttings from the installation of MW-3 were mixed with bentonite to absorb the water that was used in the drilling procedures. In MW-4, the well was drilled dry until bedrock was encountered at 32.5 feet, therefore the soil cuttings were dry and did not require solidification.

The make-up water used to drill bedrock in MW-3 and MW-4 was decanted off the bedrock chips and the water placed in separate 55-gallon steel drums. Upon completion of the field activities, the drums were sealed, labeled, and staged on a grass and partially paved area north and east of MW-3 for proper future disposal.

The drummed make-up water, purge water, and decontamination water accumulated during the field activities was processed through the wastewater pre-treatment system at the Modine facility. Once empty, the drums were triple rinsed and recycled for other use by Modine. The soil cuttings derived during the investigation are being properly disposed by Modine. A sample of the soil cuttings was collected from the drums for disposal purposes and the results are discussed in Section 5.0 of this report.

Soil borings advanced at the facility were backfilled from total depth to ground surface with bentonite chips. Borings located in paved areas were capped with concrete.

5.0 RESULTS

5.1 Laboratory Analytical Results

Laboratory analytical results for soil and groundwater samples are presented in Appendix B and are summarized in the following subsections and Tables 1,2, and 3.

5.1.1 Soil

Soil results are presented in ppm which can be considered to be equivalent to milligrams per kilogram (mg/kg) reported on an as-received basis for all parameters other than VOCs. VOCs are reported in ppb which is equivalent to micrograms per kilogram (ug/kg) reported on an as-received basis.

The results obtained for each of the soil samples are summarized in the following paragraphs:

Soil Excavation

- B-11 (composite sample 0 to 3'): This sample was collected for disposal profiling. The soil pH was 5.8 standard units (S.U.) indicating the soil is not corrosive. The paint filter test indicated no free liquids. The TCLP metals detected above the reporting limit include, barium at 0.56 milligrams per liter (mg/L) and lead at

0.068 mg/L. These metals concentrations in the leachate are well below the TCLP levels of 100 mg/l for barium and 5.0 mg/l for lead at which the soil would be defined as characteristically hazardous.

- Excavation Samples: The base and four walls were sampled and the following lead concentrations were detected above the reporting limit: north wall at 59.4 ppm, east wall at 45.9 ppm, west wall at 90.0 ppm, south wall at 57.6 ppm and the base at 87.7 ppm. These concentrations are below the background lead level of 238 ppm derived from a previous investigation.

Soil Borings

- B-13 (8.5 to 13'): The soil sample collected from soil boring B-13 at a depth of 8.5 feet to 13 feet bgs was collected along the former drain line on the west side of the building and exhibited a high field PID reading. The following VOC were reported at concentrations above the reporting limit: TCE at 204,000 ppb and tetrachloroethene (PCE) at 2,180 ppb.

- B-16 (6" to 4.5'): The soil sample collected from soil boring B-16 at a depth of 6 inches to 4.5 feet bgs exhibited a field PID reading of less than 1 ppm in isobutylene equivalents. The following VOC were reported at concentrations above the reporting limit: 1,1-dichloroethene at 10.9 ppb, TCE at 28.9 ppb, and methylene chloride at 29.0 ppb.

- B-17/MW-3 (4.5'): The soil sample collected from soil boring B-17 at a depth of 4.5 feet bgs exhibited a field PID reading of less than 1 ppm in isobutylene equivalents. The following VOC were reported in concentrations above the reporting limit: TCE at 3.5 ppb and methylene chloride at 13.0 ppb.

Drum Composite

- The only VOC detected above the reporting limit was methylene chloride at 23.8 ppb. The following total metals were detected above the reporting limit: arsenic

at 4.35 ppm, barium at 31.3 ppm, chromium at 4.5 ppm, cadmium at 0.372 ppm, and lead at 84.1 ppm.

5.1.2 Groundwater

Groundwater results are presented in ppb which is essentially equivalent to micrograms per liter (ug/l). The results obtained for each of the groundwater samples are summarized below:

Initial Sampling Event

- MW-1: The only VOC detected above the reporting limit was TCE at a concentration of 11.8 ppb.
- MW-2: No VOCs were detected above the reporting limit in the sample or duplicate sample collected from MW-2.
- MW-3: The only VOC detected above the reporting limit was TCE at a concentration of 8.0 ppb.
- MW-4: The only VOC detected above the reporting limit was TCE at a concentration of 88.9 ppb.

Quarterly Sampling Event

- MW-1: The only VOC detected above the reporting limit was TCE at a concentration of 9.4 ppb.
- MW-2: No VOCs were detected above the reporting limit.
- MW-3: No VOCs were detected above the reporting limit.
- MW-4: The only VOC detected above the reporting limit was TCE at a concentration of 142 ppb in the sample from MW-4 and a concentration of 154 ppb in the duplicate sample from MW-4.

5.1.3 Quality Assurance/Quality Control

Supporting quality assurance/quality control (QA/QC) received from the analytical laboratory consisted of method blanks for the metal and VOC analyses. Results were reported for water method blanks and soil method blanks for VOCs and soil method blanks for metals. The only VOC parameter that was detected in any of the soil method blank was methylene chloride at 10.2 ppb. No metals were detected in the soil method blanks.

The presence of methylene chloride, a common laboratory reagent, in the soil method blank makes the reported concentration of methylene chloride in the soil samples from B-16 and B-17/MW-3 suspect.

5.2 Geologic and Hydrologic Conditions

The soil samples collected from the borings indicated an underlying soil composed primarily of clays and chert. Chert fragments or bedrock remnants were encountered in all six of the borings at a depth ranging from approximately 4.5 to 13 feet bgs. Competent bedrock was encountered in the monitoring wells at a depth ranging from 32.5 feet to 55 feet bgs. Lithology varied slightly from boring to boring as illustrated in the boring logs presented in Appendix A.

Groundwater was gauged in the wells at depths ranging from approximately 147 to 161 feet bgs during the initial round of sampling. The levels dropped slightly in the second round of gauging conducted as part of the quarterly sampling in November. At this time depth to water ranged from 149 to 162 feet bgs. When groundwater elevations are calculated via standard triangulation for each event or averaged from both events, the same type of potentiometric surface map is produced. Groundwater appears to flow west-northwest with a trough from just north of MW-1 to MW-2 (Figure 3).

6.0 CONCLUSIONS

Conclusions with regard to soil, groundwater, and geological and hydrogeologic conditions at the site are the opinions of Modine and may not reflect the opinions of Sundstrand Corporation or other third parties.

6.1 Soil Analysis

Analysis of the soil samples collected from the excavation at the lead impacted area indicated that sufficient volume of soil was removed to adequately remediate the lead impact to soil.

Results from the analysis of the soil samples collected from the soil borings indicated that a VOC impact to soil exists along the storm water drain line. The TCE concentration in the subsurface soil sample from near the drain line exceeded 200,000 ppb. PCE and 1,1-dichloroethene also were present in some of the soil samples at concentrations well below applicable action levels.

Our effort to assess the extent of the VOC impact to site soil was not successful. Field indications based upon PID readings indicated no impact in borings B-16 and B-17; however, laboratory analytical results indicated TCE present in both samples. The TCE concentration of 3.5 ppb in the sample from B-17 was only slightly above background (1.6 ppb detection limit in Law report 8/93).

Methylene chloride was reportedly present in two of the three samples collected. Based upon the presence of methylene chloride in the method blank and the fact that methylene chloride is a common laboratory reagent, Dames & Moore believes that the reported methylene chloride concentration in the samples is due to laboratory introduction and is not actually present in the samples.

6.2 Groundwater Analysis

The groundwater samples collected were analyzed for full suite of VOCs. The only VOC present in the samples above the reporting levels was TCE at concentrations ranging from 8 ppb

to 154 ppb. During the initial sampling event TCE was detected above the 5.0 ppb reporting level in MW-1, MW-3, and MW-4 and during the quarterly sampling event TCE was detected above the reporting level in only MW-1 and MW-4.

6.3 Geologic and Hydrogeologic Interpretation

The soil samples collected from the borings indicated an underlying soil composed primarily of clays and chert. The abundant chert could create pathways of increased permeability within the clay. These preferential flow pathways would conduct infiltrating rainwater both laterally and vertically much more rapidly than would normally be expected in a clayey soil.

The groundwater movement through the dolomite bedrock is via secondary porosity such as fractures and solution channeling. As such, the potentiometric surface map presented as Figure 3 is likely inaccurate. Based upon the geology of the area, we believe that the measured groundwater elevations may be measurements of water levels in a fracture or jointing system that may be totally unrelated between wells. A possible groundwater scenario is presented in Figure 4, which illustrates groundwater flow direction in two distinct fracture systems. These systems may be related as perpendicular, intersecting channels or completely unrelated. Additional information maybe required to accurately assess the secondary porosity controlling groundwater movement at the site.

7.0 POTENTIAL FUTURE FOLLOW-UP WORK

Modine may, in a future work plan, undertake the following in order to adequately assess the secondary porosity system at the site and uncouple the TSD from the observed groundwater impact.

Field Fracture Survey

Valuable information could be obtained on fracture orientation by conducting a field survey of rock outcrops in the site vicinity. Based upon geologic literature, the potential exists that the underlying dolomite may outcrop in the valleys immediately north and west of the subject property. If so, the jointing or fracture system could be mapped by measuring strike and dip of

the joints observed. Determining dip would give the angle of slope of the joint system. Knowing angle of slope of the joint system will aid in the following: determining the direction of a potential source of the observed TCE contamination, assessing how quickly a contaminant may migrate vertically, assessing the potential for interconnection of the joints or fractures observed in the on-site wells, and aid in interpretation of the borehole logging results discussed in the next task.

Borehole Logging

Downhole geophysical logging of the monitoring wells at the site will be the most valuable tool in assessing fracture locations and dip. The suggested suite of logs will include: natural gamma, guard resistivity, density, caliper, neutron-neutron, SP, single point resistance, induction resistivity, and acoustic televiewer (also referred to as borehole televiewer and not to be confused with borehole television).

The most critical of this suite is the acoustic televiewer (ATV). The ATV can provide high-resolution information on the location and character of secondary porosity, such as fractures and solution openings. The ATV also can provide the strike and dip of a fracture or joint. A schematic three-dimensional view of a fracture intersecting a borehole and the appearance of the same fracture on an ATV log is presented as Figure 5. The ATV log would be sufficient if all the boreholes were uncased; however, the ATV does very poorly through PVC casing. Therefore, the remaining suite previously mentioned will be run on all the boreholes to aid in fracture assessment in the cased holes.

Packer Testing

Following completion of the borehole logging, packer tests will be conducted in the boreholes to better assess the interconnection of the on-site wells. The borehole logging will have identified jointing or fracture zones within the borehole. The purpose of a packer test is to isolate these zones and assess the water levels in each. A straddle-packer system consisting of two inflatable packers separated by a length of slotted PVC pipe will be utilized. One packer will be set above and one below the fracture zone, the water will be removed from between the packers and the return to static water level measured. By isolating and measuring the actual water level in each fracture zone an accurate water level per fracture zone can be determined. This data can

then be compared from borehole to borehole and an accurate estimate of interconnection can be assessed.

Groundwater sampling of each zone could also be conducted as part of the packer testing. Sampling would allow the acquisition of analytical data from each fracture zone and could potentially aid in defining through which zone or zones contaminants are migrating.

Geoprobe Sampling

Geoprobe advancement and sampling may be conducted to assess the TCE impact to soil at the TSD and the extent of the observed TCE impact to soil surrounding former boring B-13. The purpose of the sampling will be to uncouple the TSD from the observed TCE groundwater impact. If it can be proven that the TSD is not the source of the TCE impact at B-13 and unlikely the source of groundwater impact, MoDNR has indicated that they would then close the TSD. Subsequent investigations at the identified soil source (B-13) and the groundwater impact would then be investigated under Corrective Action or the Voluntary Program.

The Geoprobe unit will be equipped with an on-board Gas Chromatograph (GC) to obtain realtime results. Confirmatory samples will be submitted to the analytical laboratory at a rate of one sample per ten on-site GC readings (10% of the samples collected). This rate of confirmatory sampling was tentatively approved by MoDNR in our meeting of January 11, 1996.

8.0 REFERENCES

Dames & Moore, 1995, Work Plan Modification for an Investigation to Achieve Final Closure of the Interim TSD Facility, prepared for Modine Manufacturing Company.

Missouri Code of State Regulations, 1994, Title 19, Any-Use Soil Levels for Residential Settings. 19 CSR 20-9.020.

Personnel communication between Dames & Moore and Mr. Brian Peterson with Century Geophysical Corp. of Tulsa, Oklahoma.

U.S. Environmental Protection Agency, Office of Water, 1994, Drinking Water Regulations and Health Advisories.

Vineyard, Jerry D. and Feder, Gerald L. Springs of Missouri, Water Resources Report No. 29, 1982. Missouri Department of natural Resources, Division of Geology and Land Survey in cooperation with the U.S. Geological Survey and Missouri Department of Conservation.

Whitfield, John W. Surficial Geology of the Green Bay Terrace Quadrangle, Lake of the Ozarks Area, Missouri, OFM - 84-174-GI, 1984. Missouri Department of natural Resources, Division of Geology and Land Survey.

TABLES

TABLE 1

EXCAVATION DISPOSAL PROFILING COMPOSITE SOIL SAMPLE
MODINE HEAT TRANSFER, INC.
CAMDENTON, MISSOURI

(Results presented in milligrams per liter (ug/L))

Sample ID	Barium	Lead	Corrosivity pH	Paint Filter
B-11 (0-3')	0.56	0.068	5.8*	No Free Liquids

* - pH value in standard units

EXCAVATION SOIL ANALYTICAL RESULTS
MODINE HEAT TRANSFER, INC.
CAMDENTON, MISSOURI

(Results presented in part per million (ppm))

Sample ID	Lead
North Wall	59.4
East Wall	45.9
West Wall	90.0
South Wall	57.6
Base	87.7

TABLE 2

SOIL BORING ANALYTICAL RESULTS
MODINE HEAT TRANSFER, INC.
CAMDENTON, MISSOURI

(Results presented in parts per billion (ppb) unless noted)

Sample Identification		VOC Constituent			
Soil Boring	Depth (feet)	TCE	PCE	1,1-Dichloroethene	Methylene Chloride
B-13	8.5-13	204,000	2,180	ND	ND
B-16	6"-4.5	28.9	ND	10.9	29.0 B
B-17	4.5	3.5	ND	ND	13.0 B

B - Detected in the method blank
ND - Not Detected at or above the reporting limit

TABLE 3

GROUNDWATER ANALYTICAL RESULTS
MODINE HEAT TRANSFER, INC.
CAMDENTON, MISSOURI

(Results presented in parts per billion (ppb) unless noted)

Sample ID	Date	TCE**
MW-1	8/16/95	11.8
MW-2	8/22/95	ND
Dup-1 (MW-2)	8/22/95	ND
MW-3	8/22/95	8.0
MW-4	8/22/95	88.9
MW-1	11/15/95	9.4
MW-2	11/15/95	ND
MW-3	11/15/95	ND
MW-4	11/15/95	142
Dup-1 (MW-4)	11/15/95	154

ND - Not Detected at or above the reporting limit

** - All other VOC parameters not detected above reporting levels

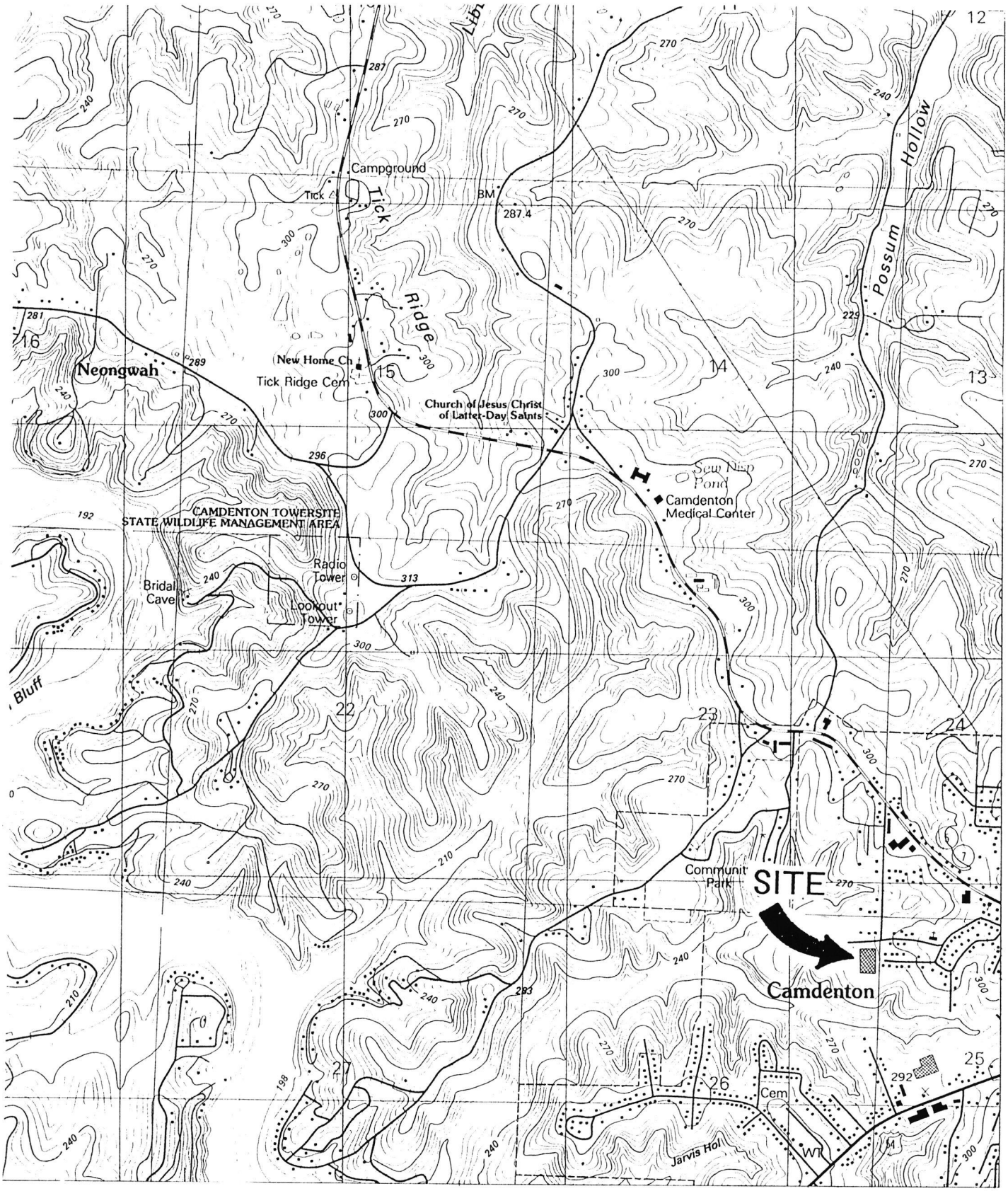
TABLE 4

WELL COMPLETION DATA
MODINE HEAT TRANSFER, INC.
CAMDENTON, MISSOURI

Monitoring Well ID	Date Installed	Water Level Depth - Date Recorded	Casing Material	Casing Diameter	Depth to Screen	Screened Interval	TOC Elevation	Total Depth
MW-1	7/92	148.35' - 8/22/95 149.07' - 11/15/95	PVC	2"	NR	NR	186.61'	161'
MW-2	7/92	160.52' - 8/22/95 161.45' - 11/15/95	PVC	2"	NR	NR	204.26'	197'
MW-3	8/9/95	147.71' - 8/22/95 149.52' - 11/15/95	Steel Surface Casing to 63'; Open Hole 63' to 167'	5"* 4-3/4"	None	Open Hole 63' to 167'	193.74'	167'
MW-4	8/11/95	149.18' - 8/22/95 150.63 - 11/15/95	Steel Surface Casing to 43'; Open Hole 43' to 158'	5"* 4-3/4"	None	Open Hole 43' to 158'	192.24'	158'

NR - No Reported
* - Surface Casing Diameter

FIGURES



GREEN BAY TERRACE, MISSOURI

Adapted from United States Geological Survey
7.5 Minute Quadrangle (Topographic)
1983

Scale in Feet

0 500 1000 2000 4000

N

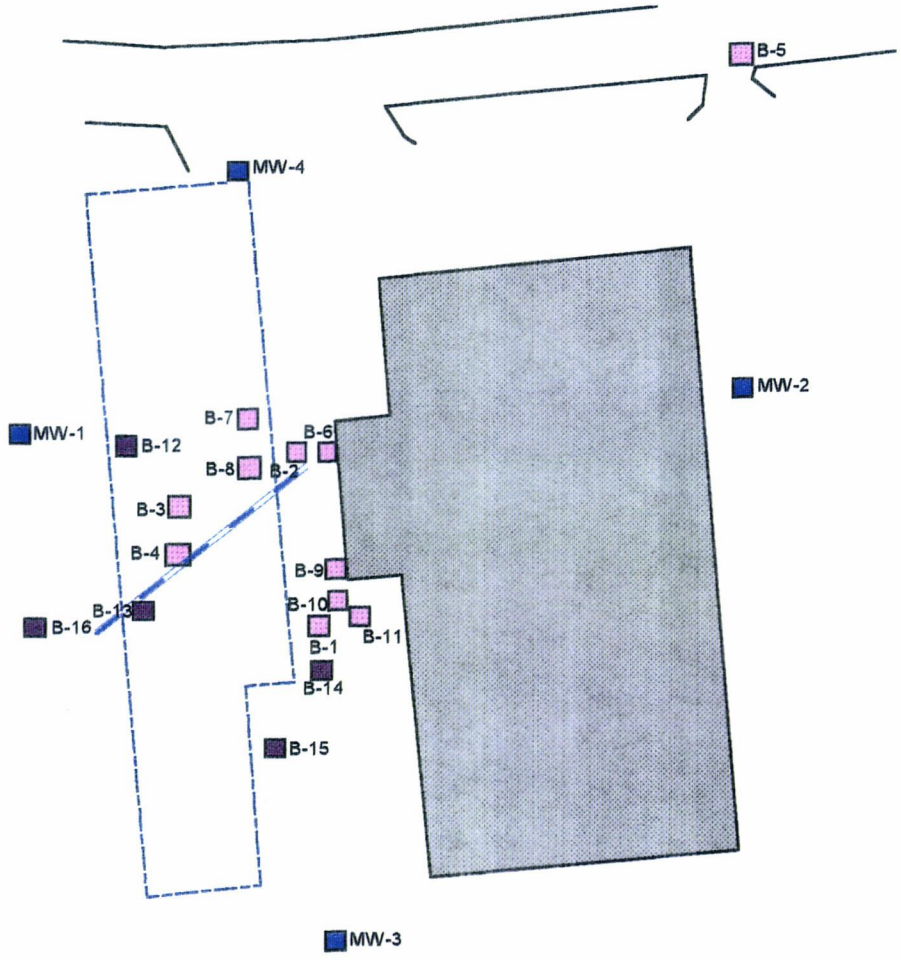
Figure 1
SITE LOCATION MAP

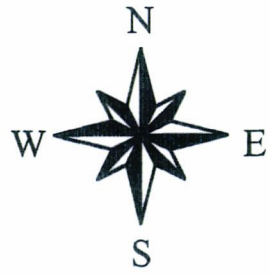
Modine Heat Transfer, Inc.
Camdenton, Missouri

Scale 1:24,000

DAMES & MOORE, INC.

Figure 2: Soil Boring and Monitoring Well Locations



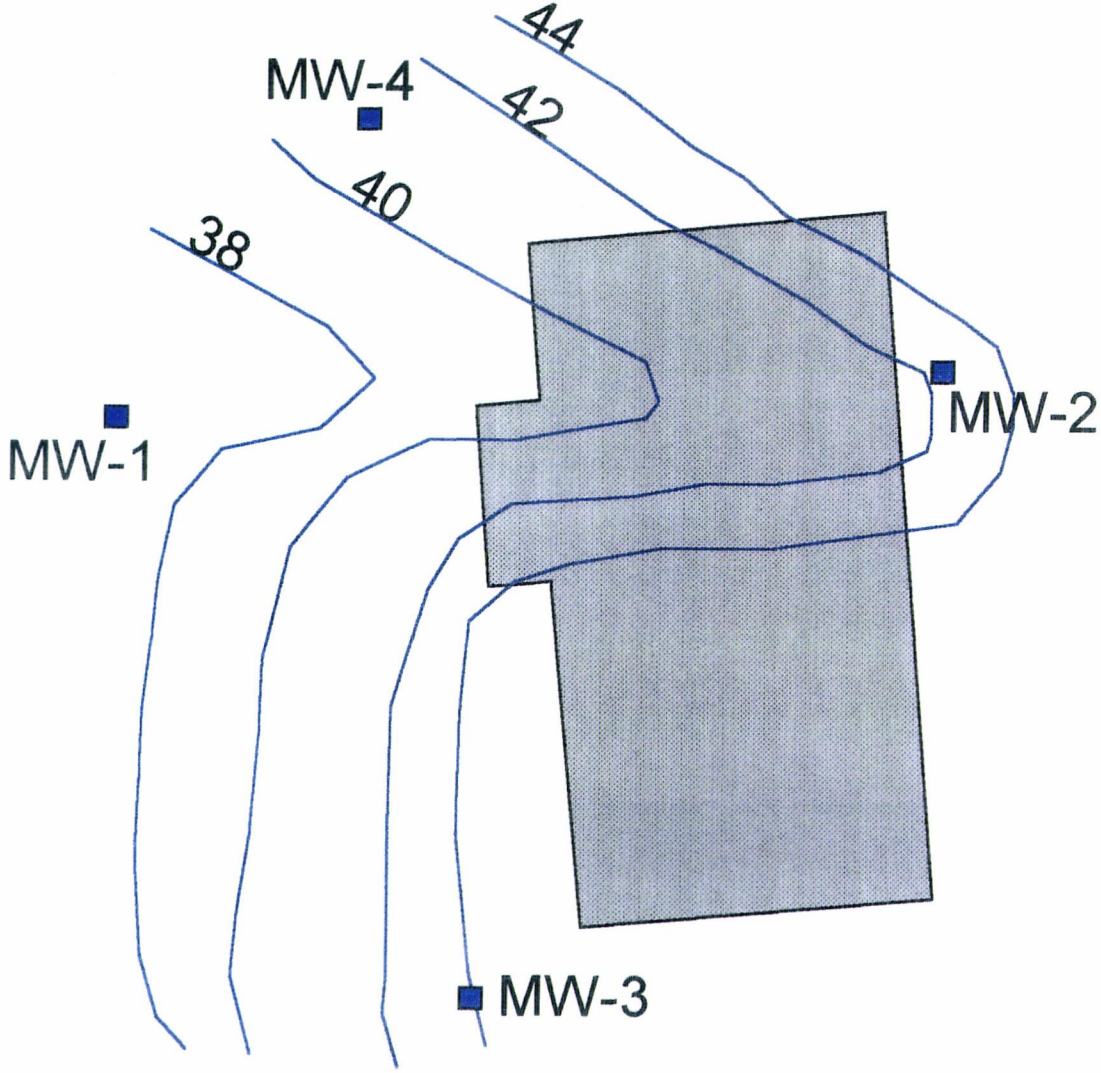


Modine Heat Transfer, Inc.
Camdenton, Missouri

Drain Line
Parking Lot
Street
Soil Borings
Current
Former
Monitoring Wells
Building

Approximate Scale 1"=130'

Figure 3: Calculated Groundwater Contour Map



Approximate Scale 1" = 130'

mw-1

186.61 - 148.35	38.26
186.61 - 149.07	37.54

mw-2

204.26 - 160.52	43.74
204.26 - 161.45	42.81

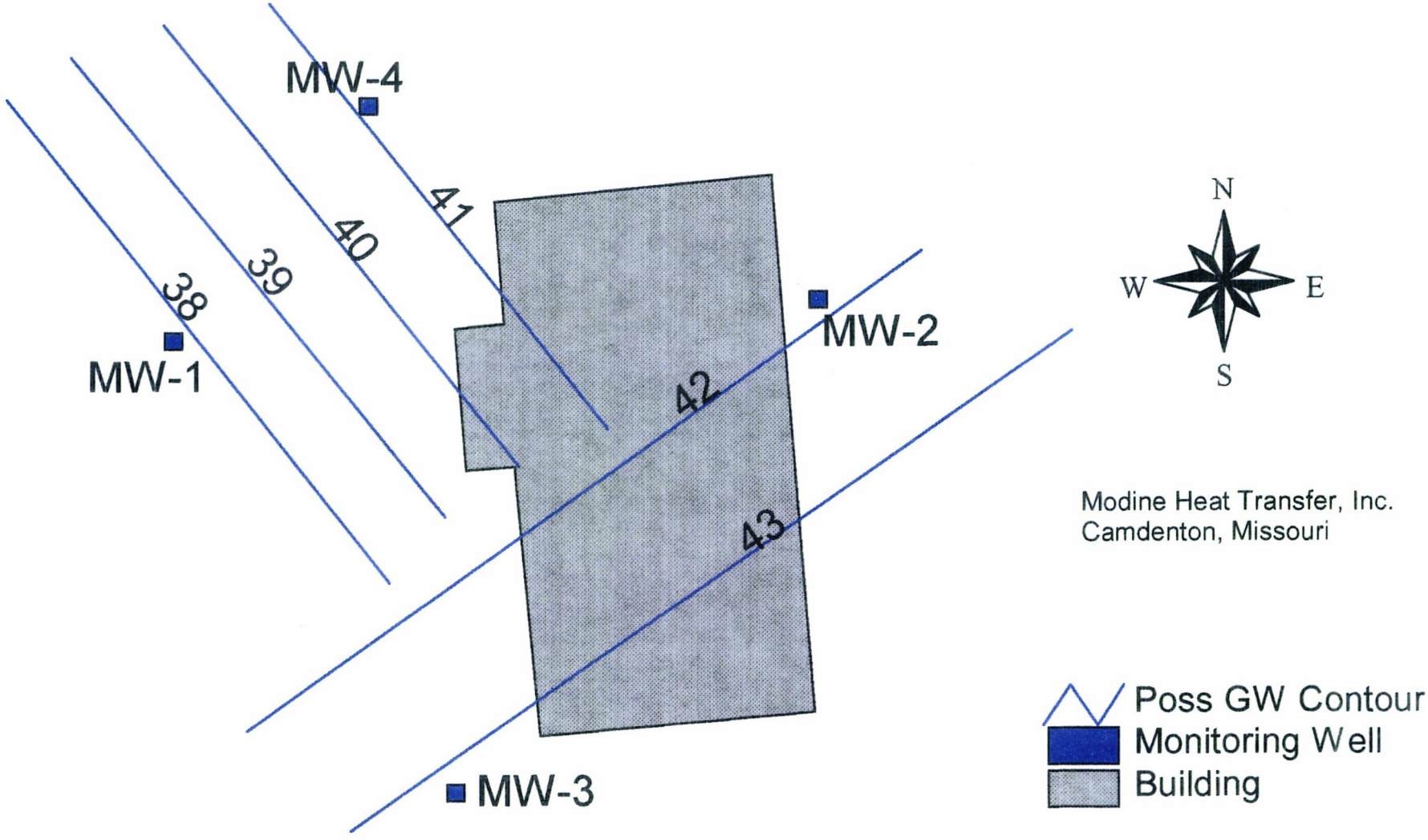
mw-3

193.74 - 147.71	46.03
193.74 - 149.52	44.22

mw-4

192.24 - 149.18	43.06
192.24 - 150.63	41.61

Figure 4: Possible Groundwater Contour Map



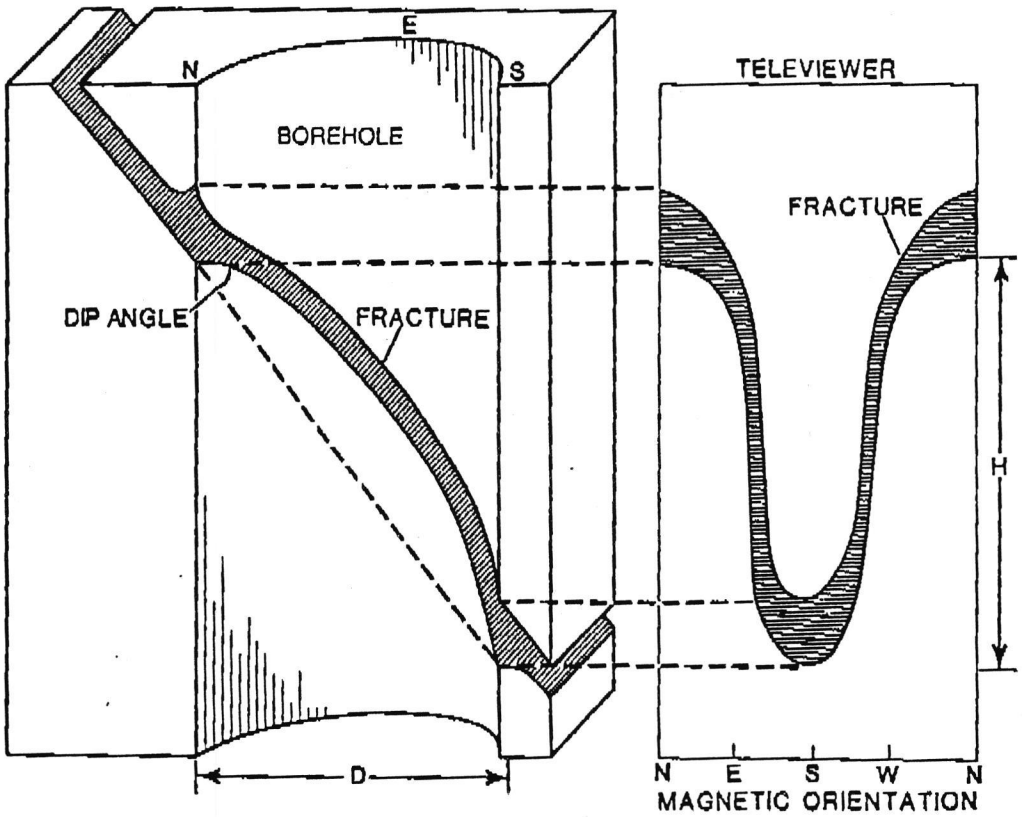


Figure 5
THREE DIMENSIONAL VIEW OF A FRACTURE AND ASSOCIATED ATV LOG

Modine Heat Transfer, Inc.
Camdenton, Missouri

DAMES & MOORE, INC.

APPENDIX A

SOIL BORING AND MONITORING WELL LOGS

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Concrete/Asphalt

SOIL BORING ID B-12

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Stratigraphy	Depth (ft.)	OVM (ppm)	Completion	Sample Lab	Sample Interval	Sample Type
0 -6" Concrete 6" - 4 1/2' CLAY, red, with gravel to a gray clay at approximately 4' 4". 2' of recovery.	CL		0 1 2 3	18.0	BENTONITE GROUT	N	6"-4.5	CC
4 1/2' - 6 CLAY, gray, with gravel and slight odor. 1' of recovery. Total Depth - 6' at auger refusal.	CL		4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	40.1		N	4.5-6	CC

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Concrete

SOIL BORING ID B-13

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Depth (ft.)	OVM (ppm)	Completion	Sample Lab	Sample Interval	Sample Type
0 -6" Concrete		0					
6" - 4 1/2' CLAY, red, with gravel, slight septic odor, dry. 1 1/2' of recovery.	CL	1	82.3		N	6"-4.5	CC
		2					
		3					
4 1/2' - 8 1/2' CLAY, red, with gravel, slight septic odor, dry to gray clay at approximatley 7'. 2 1/2 ' of recovery.	CL	4	403		N	4.5-8.5	CC
		5					
		6					
		7					
8 1/2' - 13' CLAY, red, with gravel, some areas of gray clay, strong septic odor, very moist,	CL	8	787	BENTONITE GROUT	Y	8.5-13	CC
		9					
		10					
		11					
Total Depth - 13' at auger refusal.		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Gravel

SOIL BORING ID B-14

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Stratigraphy	Depth (ft.)	OVM (ppm)	Completion	Sample Lab	Sample Interval	Sample Type
0 -6" Gravel 6" - 4 ' CLAY, brown to gray, with gravel, moist. 1 1/2' of recovery. Total Depth - 4 1/2 ' at auger refusal.	CL		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	8.9	BENTONITE GROUT	N	6"-4'	CC

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Gravel

SOIL BORING ID B-15

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Depth (ft.)	OVM (ppm)	Completion	Sample Lab	Sample Interval	Sample Type
0 -3' No Recovery.		0-3		BENTONITE GROUT			
3'- 4' Gravel to clay, red, with gravel, dry at 3' 6" to asphalt at 3' 8".		3			N	3-4'	CC
4'-4 1/2' CLAY, red, with gravel, dry.	CL	4	1.3		N	4-4.5'	CC
4 1/2' - 7 1/2' CLAY, red, with silt and gravel, very moist.	CL	5-7	16.3		N	4.5-7.	CC
Total Depth - 7 1/2' at auger refusal.		7					

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Grass

SOIL BORING ID B-16

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Stratigraphy	Depth (ft.)	OVM (ppm)	Completion	Sample: Lab	Sample: Interval	Sample: Type
0 -6" Grassy Top Soil 6" - 4 1/2' CLAY, gray, with gravel, very soft, moist, slight septic odor. 1' of recovery. Total Depth - 4 1/2 ' at auger refusal.	CL		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	0.5	BENTONITE GROUT	Y	6"-4.5'	CC

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

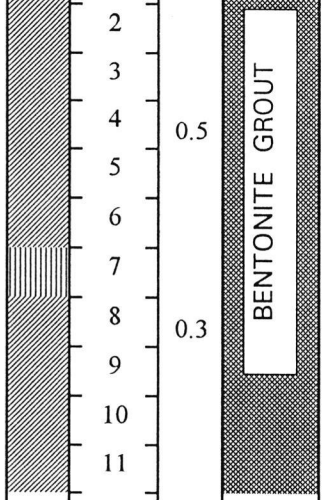
Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western Kansas City
Borehole Logged By: Miesche Francis
Drilling Method: Hollow Stem Auger
Date Installed: August 7, 1995
Surface Conditions: Grass

SOIL BORING ID B-17

Monitoring Well Data:	Elevation:
Pipe:	Datum:
Screen:	Ground Surface:
Slot:	Measuring Pt:
Sand:	Top of Casing:

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Depth (ft.)	OVM (ppm)	Completion	Sample Lab	Sample Interval	Sample Type
0 -6" Grassy Top Soil		0					
6" - 4 1/2' CLAY, red, with gravel and chert, dry. 1' of recovery.	CL	1	0.3		N	6"-4.5'	CC
		2					
		3					
4 1/2'-8 1/2' Same as above grading to mois, to Silt, black with gravel, very hard at 7 1/2 '.	CL	4	0.5		Y	4.5-8.5	CC
		5					
		6					
	ML	7					
8 1/2' - 12' CLAY, red, with cherty gravel, moist, to approximately 1" of grey silty clay with gravel at the base.	CL	8	0.3		N	8.5-12	CC
		9					
		10					
Total Depth - 12' at auger refusal.		11					
		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					



Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western St. Louis
Borehole Logged By: Miesche Francis
Drilling Method: Air Rotary
Date Installed: August 8-9, 1995
Surface Conditions: Grass

MONITORING WELL ID MW-3

Monitoring Well Data:		Elevation:	
Pipe:	6" dia to 63'	Datum:	
Screen:	None	Ground Surface:	92.98'
Slot:	None	Measuring Pt:	
Sand:	None	Top of Casing:	93.74'

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Stratigraphy	Depth (ft.)	OVM (ppm)	Completion	Sample: Lab	Sample: Interval	Sample: Type
0 - 15' CLAY, red, with abundant cherty gravel, fill.	CL		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14		6" DIAMETER STEEL CASING			
15 - 23' CLAY, red, with abundant chert.	CL		15 16 17 18 19 20 21 22					
23 - 28' Same as above with sand in part.	CL		23 24 25 26 27					
28-43' Same as above including brown color with some chalky chert at approximately 40 feet.	CL		28 29 30 31 32 33 34 35 36 37 38 39 40 41 42					
43 - 55' Same as above.	CL		43 44 45 46					

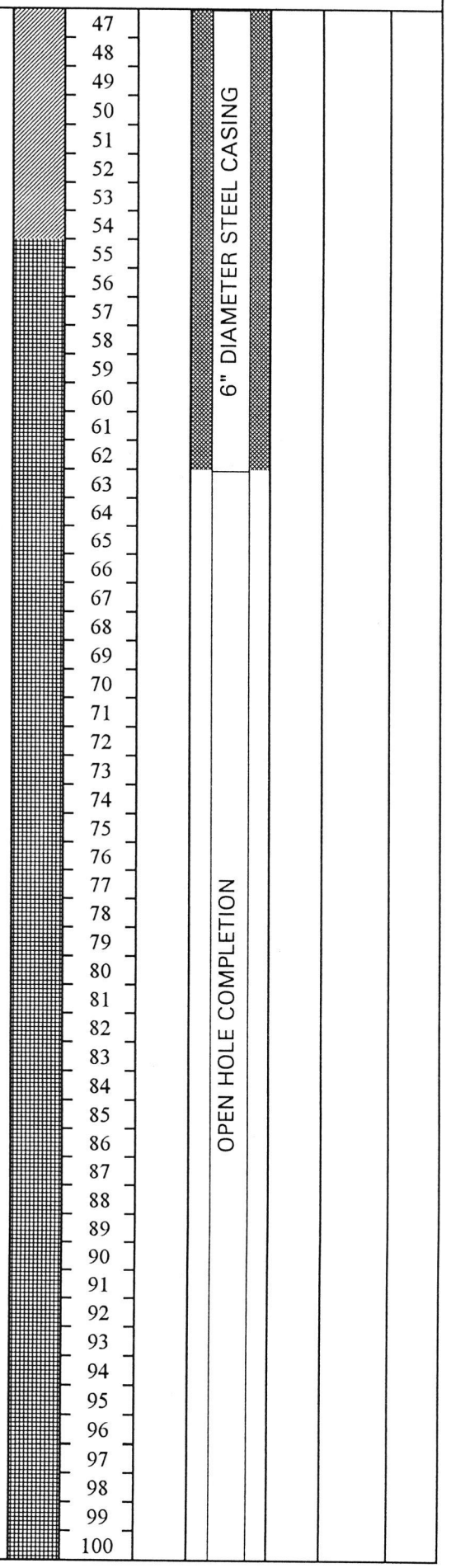
MONITORING WELL MW-3 (CON'T)

55' Competent bedrock, dolomite and chert. Set casing 55 to 63 feet.

65 - 90' Dolomite, brown to off-white, with some gray at 70'.

90 - 100' Dolomite, gray.

100 - 110' Dolomite, brown to tan with some chert.

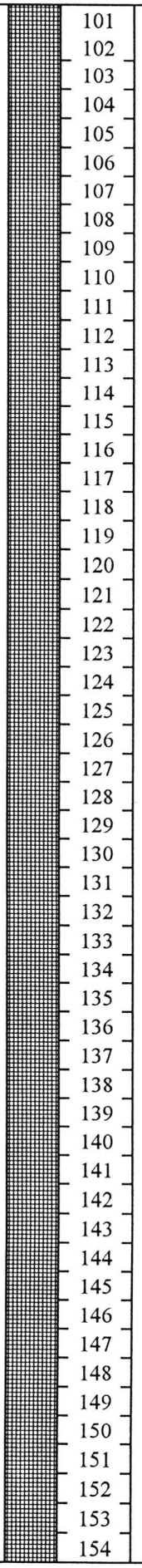


MONITORING WELL MW-3 (CON'T)

110 - 140' Dolomite, brown to grey, with chert.

140 - 155' Dolomite, brown.

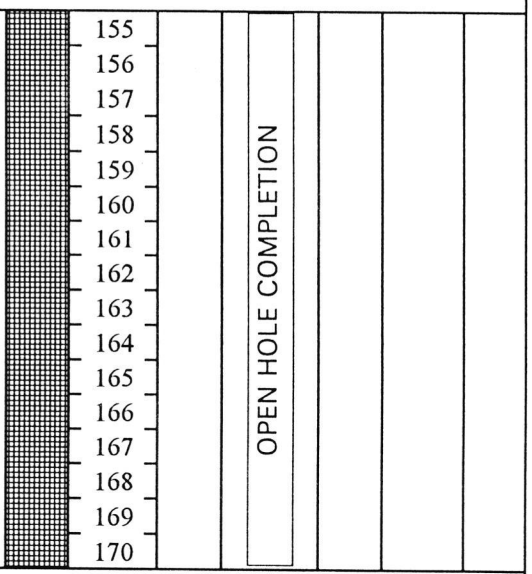
148 - 152' Fracture Zone according to driller.



MONITORING WELL MW-3 (CON'T)

155 - 170' Same as above with coarser grains, some quartz (probably fracture fill).

Total Depth 170'.



Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

Client: Modine Heat Transfer, Inc.
Project Number: 27397-005
Project: RCRA TSD Facility Closure
Location: Camdenton, MO
Driller: Layne-Western St. Louis
Borehole Logged By: Miesche Francis
Drilling Method: Air Rotary
Date Installed: August 11, 1995
Surface Conditions: Asphalt

MONITORING WELL ID MW-4

Monitoring Well Data:
Pipe: 6" dia to 43'
Screen: None
Slot: None
Sand: None

Elevation:
Datum:
Ground Surface: 93.10'
Measuring Pt:
Top of Casing: 92.24'

Sample Type
CT - Cuttings
SS - Split Spoon
WA - Wash Sample
CC - Continous Core
RX - Rock Core
ST - Shelby Tube

DESCRIPTION	USCS	Stratigraphy	Depth (ft.)	OVM (ppm)	Completion	Sample: Lab	Sample: Interval	Sample: Type
0 - 15' CLAY, red, with cherty gravel and coarse sand, moist.	CL		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14		6" DIAMETER STEEL CASING			
15 - 16' CLAY, red, with cherty gravel and fine to corse sand, moist. 16 - 20' SAND, brown, fine grained, with clay and trace gravel.	CL SC		15 16 17 18 19					
20 - 25' CLAY, red, with abundant chert.	CL		20 21 22 23 24 25 26 27 28 29					
25 - 30' Broken up chert and dolomite are present.								
30 - 32.5 ' SAND, red, fine grained, with clay and cherty gravel.	SC		30 31 32					
32.5' Compotent bedrock set casing 32.5' to 43 '.			33					
35 - 40' Chert and dolomite, tan.			34 35 36 37 38 39					
40 - 43' Chert and dolomite with some shale.			40 41 42					
43 - 50' Dolomite, brown.			43 44 45 46		O. H. C.			

MONITORING WELL MW-4 (CON'T)

55 - 60' Chert, with open space textures (quartz on chert).

60 - 65' Dolomite, brown with abundant chert.

65 - 70' Dolomite, brown, with trace amounts of chert.

70 - 75' Dolomite, grey to brown

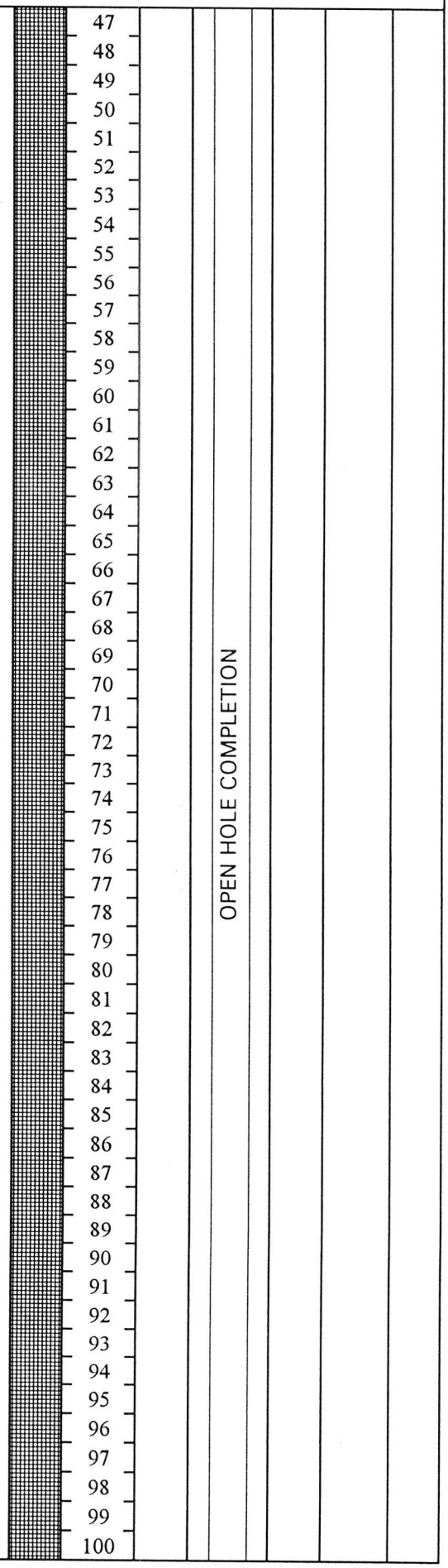
75 - 85' Dolomite, grey to brown, with chert.

85 - 90' Dolomite grey to tan.

88' Dolomite, brown, with some sand.

90 - 95' Dolomite, grey.

95 - 115' Dolomite, brown.

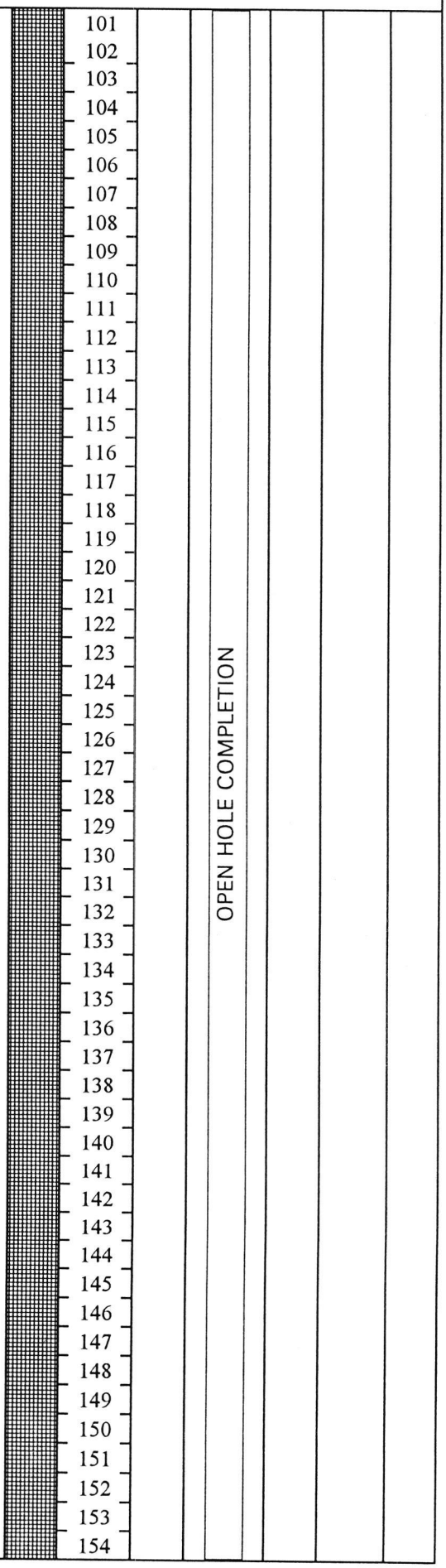


MONITORING WELL MW-4 (CON'T)

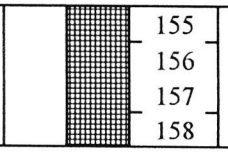
115 - 120' Dolomite, brown to grey.

120 - 145' Dolomite, with grey chert.

145 - 158' Chert, gray.



MONITORING WELL MW-4 (CON'T)



Total Depth 158'.

Note: This borehole was prepared for hydrogeological and/or environmental assessment purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by Dames & Moore personnel before use by others.

APPENDIX B

LABORATORY ANALYTICAL RESULTS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

August 9, 1995

Dan Price
Dames & Moore
2135 East Sunshine
Springfield, MO 65804

RE: ATAS #13633.01
#27397-005 - Modine TSD

Dear Mr. Price:

Enclosed is the analytical report for the sample received in our laboratory on August 3, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/sdp

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1363301MT(231)

DATE : 08-09-95

SAMPLE MATRIX : SOIL
ATAS # : 13633.01
DATE SUBMITTED: 08-03-95
DATE EXTRACTED: 08-03-95
PROJECT : #27397-005 - MODINE TSD
SAMPLE ID : B-11 0'-3'

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
INORGANICS					
CORROSIVITY pH		S.U.@25c	5.8	08-03-95	EPA 150.1
PAINT FILTER			NO FREE LIQUIDS	08-03-95	SW 9095
TCLP TOXICITY METALS					
ARSENIC	0.100	mg/L	ND	08-08-95	SW 6010
BARIUM	0.005	mg/L	0.56	08-08-95	SW 6010
CADMIUM	0.004	mg/L	ND	08-08-95	SW 6010
CHROMIUM	0.005	mg/L	ND	08-08-95	SW 6010
LEAD	0.040	mg/L	0.068	08-08-95	SW 6010
SILVER	0.010	mg/L	ND	08-08-95	SW 6010
SELENIUM	0.100	mg/L	ND	08-08-95	SW 6010
MERCURY	0.0015	mg/L	ND	08-07-95	SW 7470

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1363301MT(231)
DATE : 08-09-95

SAMPLE MATRIX : TCLP LEACHATE
ATAS # : TCLP BLANK
DATE SUBMITTED: 08-03-95
DATE EXTRACTED: 08-03-95
PROJECT : #27397-005 - MODINE TSD
SAMPLE ID : TCLP BLANK

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
TCLP TOXICITY METALS					
ARSENIC	0.100	mg/L	ND	08-08-95	SW 6010
BARIUM	0.005	mg/L	ND	08-08-95	SW 6010
CADMIUM	0.004	mg/L	ND	08-08-95	SW 6010
CHROMIUM	0.005	mg/L	ND	08-08-95	SW 6010
LEAD	0.040	mg/L	ND	08-08-95	SW 6010
SILVER	0.010	mg/L	ND	08-08-95	SW 6010
SELENIUM	0.100	mg/L	ND	08-08-95	SW 6010
MERCURY	0.0015	mg/L	ND	08-07-95	SW 7470

mg/L = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1363301MT(231)

DATE : 08-09-95

QA/QC

DESCRIPTION		PARAMETER	RESULTS	
METHOD BLANK	08-08-95	ARSENIC	<0.100	mg/L
METHOD BLANK	08-08-95	BARIUM	<0.005	mg/L
METHOD BLANK	08-08-95	CADMIUM	<0.004	mg/L
METHOD BLANK	08-08-95	CHROMIUM	<0.005	mg/L
METHOD BLANK	08-08-95	LEAD	<0.04	mg/L
METHOD BLANK	08-08-95	SILVER	<0.01	mg/L
METHOD BLANK	08-08-95	SELENIUM	<0.10	mg/L
METHOD BLANK	08-07-95	MERCURY	<0.002	mg/L
BLANK SPIKE	08-08-95	ARSENIC	100 %	RECOVERY
BLANK SPIKE	08-08-95	BARIUM	100 %	RECOVERY
BLANK SPIKE	08-08-95	CADMIUM	110 %	RECOVERY
BLANK SPIKE	08-08-95	CHROMIUM	100 %	RECOVERY
BLANK SPIKE	08-08-95	LEAD	104 %	RECOVERY
BLANK SPIKE	08-08-95	SILVER	104 %	RECOVERY
BLANK SPIKE	08-08-95	SELENIUM	105 %	RECOVERY
BLANK SPIKE	08-07-95	MERCURY	94 %	RECOVERY

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

CHAIN OF CUSTODY RECORD

ATAS Client Name: DAMES & MOORE

Project Name: Modine TSD

Project #: 27397-005

Form Completed By: Miesche Francis

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: TCLP Metals; Paint Filter test; Corrosivity (pH)	Preservative: Ice / Chemical (see below)	Remarks	Lab Use Only: Initials / Date / Location/Temp
B-11 0'-3'	8-2-95	1018	Soil		X	1			5 day turn around	13633.01 LM 8-3-95 162 5°C

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: Miesche Francis	Signature: L. Massenberg	Signature:	Signature:
Printed Name: Miesche Francis	Printed Name: ATAS	Printed Name:	Printed Name:
Firm: Dames & Moore	Firm: 8/3/95 0918	Firm:	Firm:
Date/Time: 8-2-95/1500	Date/Time:	Date/Time:	Date/Time:

Turnaround Requirements

- ___ 1 to 2 working days
- ___ 3 working days
- ✓ 5 working days
- ___ 10 working days
- ___ 15 working days

Preservative codes

- A - none
- B - HNO_3
- C - H_2SO_4
- D - NaOH
- E - HCl
- F - _____

SEND RESULTS TO (Name & Company): DAN PRICE DAMES & MOORE

Original to ATAS/Copy to Client

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

August 18, 1995

Dan Price
Dames & Moore
1675-L East Seminole
Springfield, MO 65804

RE: ATAS #13708.01-#13708.06
Modine

Dear Mr. Price:

Enclosed are the analytical reports for the samples received in our laboratory on August 16, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/pck

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
1675-L EAST SEMINOLE
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 13708PB(221)

DATE : 08-18-95

SAMPLE MATRIX : SOIL
ATAS EPISODE : #13708
DATE SUBMITTED: 08-16-95
DATE ANALYZED : 08-17-95
PROJECT : MODINE
METHOD REF. : SW 6010

RESULTS REPORTED IN mg/Kg OR PARTS PER MILLION(PPM)

LEAD

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
NORTH WALL	13708.01	4.0	59.4
EAST WALL	13708.02	4.0	45.9
WEST WALL	13708.03	4.0	90.0
SOUTH WALL	13708.04	4.0	57.6
BOTTOM	13708.05	4.0	87.7

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
1675-L EAST SEMINOLE
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 13708PB(221)

DATE : 08-18-95

SAMPLE MATRIX : WATER
ATAS EPISODE : #13708
DATE SUBMITTED: 08-16-95
DATE ANALYZED : 08-17-95
PROJECT : MODINE
METHOD REF. : SW 6010

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

LEAD

CLIENT ID	ATAS ID	REPORTING LIMIT	RESULTS
EB-1	13708.06	3.0	ND

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
1675-L EAST SEMINOLE
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: QC817PB(221)

DATE : 08-18-95

QA/QC

DESCRIPTION		PARAMETER	RESULTS	
METHOD BLANK	08-17-95	LEAD	<4.0	mg/Kg
METHOD BLANK	08-17-95	LEAD	<3.0	ug/L
BLANK SPIKE	08-17-95	LEAD	90 %	RECOVERY
BLANK SPIKE	08-17-95	LEAD	100 %	RECOVERY

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

CHAIN OF CUSTODY RECORD

ATAS Client Name: DAMES & MOORE

Project Name: Modine

Project #:

Form Completed By: MIESCHE FRANCIS

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: Total Lead	Preservative: Ice	Preservative: Chemical (see below)	Remarks	Lab Use Only: Initials LM; Date 8-16-95; Location/Temp BA 5C
NORTH WALL	8/14	1502	Soil	✓		1	X			24 HR TURN-	13708.01
EAST WALL	8/14	1511	Soil	✓		1	X			AROUND	02
WEST WALL	8/14	1525	Soil	✓		1	X			CALL W/	03
SOUTH WALL	8/14	1517	Soil	✓		1	X			RESULTS	04
BOTTOM	8/14	1533	Soil	✓		1	X			ASAP.	05
EB-1	8/14	1510	Water			1	X				06

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: Miesche Francis	Signature: Walter Dotson	Signature:	Signature:
Printed Name: MIESCHE FRANCIS	Printed Name: WALTER DOTSON	Printed Name:	Printed Name:
Firm: DAMES & MOORE	Firm: ATAS	Firm:	Firm:
Date/Time: 8/15/95 - 1100	Date/Time: 8/16/95 0915	Date/Time:	Date/Time:

Turnaround Requirements
- X 1 to 2 working days
- ___ 3 working days
- ___ 5 working days
- ___ 10 working days
- ___ 15 working days

Preservative codes
- A - none
- B - HNO_3
- C - H_2SO_4
- D - NaOH
- E - HCl
- F - ____

SEND RESULTS TO (Name & Company): DAN PRICE DAMES & MOORE

Original to ATAS/Copy to Client

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

August 23, 1995

Dan Price
Dames & Moore
2135 East Sunshine, Suite 105
Springfield, MO 65804

RE: ATAS #13691.01-#13691.03
Modine

Dear Mr. Price:

Enclosed are the analytical reports for the samples received in our laboratory on August 12, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/sdp

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)
DATE : 08-23-95

SAMPLE MATRIX : SOIL
ATAS # : 13691.01
DATE SUBMITTED: 08-12-95
DATE ANALYZED : 08-17-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : B-13 8 1/2-13

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	1250	ND
VINYL CHLORIDE	1250	ND
BROMOMETHANE	1250	ND
CHLOROETHANE	1250	ND
triCL,Fl-METHANE	1250	ND
1,1-DICHLOROETHENE	1250	ND
METHYLENE CHLORIDE	1250	ND
trans-1,2-DICHLOROETHENE	1250	ND
1,1-DICHLOROETHANE	1250	ND
CHLOROFORM	1250	ND
1,1,1-TRICHLOROETHANE	1250	ND
CARBON TETRACHLORIDE	1250	ND
1,2-DICHLOROETHANE	1250	ND
TRICHLOROETHENE	1250	204000
1,2-DICHLOROPROPANE	1250	ND
Br,diCl METHANE	1250	ND
2-ClETHYL VINYL ETHER	1250	ND
trans-1,3-DICHLOROPROPENE	1250	ND
cis-1,3-diCl PROPENE	1250	ND
1,1,2-TRICHLOROETHANE	1250	ND
TETRACHLOROETHENE	1250	2180
diBr,Cl METHANE	1250	ND
CHLOROBENZENE	1250	ND
BROMOFORM	1250	ND
TETRACHLOROETHANE	1250	ND
1,3-DICHLOROBENZENE	1250	ND
1,4-DICHLOROBENZENE	1250	ND
1,2-DICHLOROBENZENE	1250	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	* 175 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	84 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)
DATE : 08-23-95

SAMPLE MATRIX : SOIL
ATAS # : 13691.02
DATE SUBMITTED: 08-12-95
DATE ANALYZED : 08-18-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : B-16 6-4 1/2

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	10.9
METHYLENE CHLORIDE	5.0	29.0 B
trans-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	28.9
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
trans-1,3-DICHLOROPROPENE	5.0	ND
cis-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	105 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	73 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)
DATE : 08-23-95

SAMPLE MATRIX : SOIL
ATAS # : 13691.03
DATE SUBMITTED: 08-12-95
DATE ANALYZED : 08-17-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : B-17 (MW3) 4 1/2

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	1.0	ND
VINYL CHLORIDE	1.0	ND
BROMOMETHANE	1.0	ND
CHLOROETHANE	1.0	ND
triCL,Fl-METHANE	1.0	ND
1,1-DICHLOROETHENE	1.0	ND
METHYLENE CHLORIDE	1.0	13.0 B
trans-1,2-DICHLOROETHENE	1.0	ND
1,1-DICHLOROETHANE	1.0	ND
CHLOROFORM	1.0	ND
1,1,1-TRICHLOROETHANE	1.0	ND
CARBON TETRACHLORIDE	1.0	ND
1,2-DICHLOROETHANE	1.0	ND
TRICHLOROETHENE	1.0	3.5
1,2-DICHLOROPROPANE	1.0	ND
Br,diCl METHANE	1.0	ND
2-ClETHYL VINYL ETHER	1.0	ND
trans-1,3-DICHLOROPROPENE	1.0	ND
cis-1,3-diCl PROPENE	1.0	ND
1,1,2-TRICHLOROETHANE	1.0	ND
TETRACHLOROETHENE	1.0	ND
diBr,Cl METHANE	1.0	ND
CHLOROBENZENE	1.0	ND
BROMOFORM	1.0	ND
TETRACHLOROETHANE	1.0	ND
1,3-DICHLOROBENZENE	1.0	ND
1,4-DICHLOROBENZENE	1.0	ND
1,2-DICHLOROBENZENE	1.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	108 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	70 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : SOIL
ATAS # : METHOD BLANK
DATE SUBMITTED: 08-12-95
DATE ANALYZED : 08-17-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	1.0	ND
VINYL CHLORIDE	1.0	ND
BROMOMETHANE	1.0	ND
CHLOROETHANE	1.0	ND
triCL,Fl-METHANE	1.0	ND
1,1-DICHLOROETHENE	1.0	ND
METHYLENE CHLORIDE	1.0	10.2
trans-1,2-DICHLOROETHENE	1.0	ND
1,1-DICHLOROETHANE	1.0	ND
CHLOROFORM	1.0	ND
1,1,1-TRICHLOROETHANE	1.0	ND
CARBON TETRACHLORIDE	1.0	ND
1,2-DICHLOROETHANE	1.0	ND
TRICHLOROETHENE	1.0	ND
1,2-DICHLOROPROPANE	1.0	ND
Br,diCl METHANE	1.0	ND
2-ClETHYL VINYL ETHER	1.0	ND
trans-1,3-DICHLOROPROPENE	1.0	ND
cis-1,3-diCl PROPENE	1.0	ND
1,1,2-TRICHLOROETHANE	1.0	ND
TETRACHLOROETHENE	1.0	ND
diBr,Cl METHANE	1.0	ND
CHLOROBENZENE	1.0	ND
BROMOFORM	1.0	ND
TETRACHLOROETHANE	1.0	ND
1,3-DICHLOROBENZENE	1.0	ND
1,4-DICHLOROBENZENE	1.0	ND
1,2-DICHLOROBENZENE	1.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE	(65-135%)	88 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE	(40-140%)	86 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : MATRIX SPIKE
DATE ANALYZED : 08-17-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/Kg)	BLANK SAMPLE CONC. (ug/Kg)	CONTROL MS MATRIX SPIKE CONC. (ug/Kg)	MS PERCENT RECOVERY
CHLOROMETHANE	20.0	ND	21.0	105.0
VINYL CHLORIDE	20.0	ND	19.9	99.5
BROMOMETHANE	20.0	ND	20.3	101.5
CHLOROETHANE	20.0	ND	20.4	102.0
triCL,Fl-METHANE	20.0	ND	24.3	121.5
1,1-DICHLOROETHENE	20.0	ND	23.3	116.5
METHYLENE CHLORIDE	20.0	10.2	37.9	138.5
trans-1,2-DICHLOROETHENE	20.0	ND	21.4	107.0
1,1-DICHLOROETHANE	20.0	ND	22.2	111.0
CHLOROFORM	20.0	0.1	20.4	101.5
1,1,1-TRICHLOROETHANE	20.0	ND	22.3	111.5
CARBON TETRACHLORIDE	20.0	ND	22.3	111.5
1,2-DICHLOROETHANE	20.0	ND	21.2	106.0
TRICHLOROETHENE	20.0	ND	19.8	99.0
1,2-DICHLOROPROPANE	20.0	ND	19.6	98.0
Br,diCl METHANE	20.0	ND	20.0	100.0
2-ClETHYL VINYL ETHER	20.0	ND	20.9	104.5
trans-1,3-DICHLOROPROPENE	20.0	ND	20.1	100.5
cis-1,3-diCl PROPENE	20.0	ND	21.7	108.5
1,1,2-TRICHLOROETHANE	20.0	ND	21.8	109.0
TETRACHLOROETHENE	20.0	ND	21.6	108.0
diBr,Cl METHANE	20.0	ND	21.4	107.0
CHLOROBENZENE	20.0	ND	21.3	106.5
BROMOFORM	20.0	ND	19.9	99.5
TETRACHLOROETHANE	20.0	ND	21.2	106.0
1,3-DICHLOROBENZENE	20.0	ND	21.9	109.5
1,4-DICHLOROBENZENE	20.0	ND	21.6	108.0
1,2-DICHLOROBENZENE	20.0	ND	20.9	104.5

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : MATRIX SPIKE DUPLICATE
DATE ANALYZED : 08-17-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/Kg)	CONTROL MSD SPIKE DUP. CONC. (ug/Kg)	MSD PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
CHLOROMETHANE	20.0	22.8	114.0	8.22
VINYL CHLORIDE	20.0	21.6	108.0	8.19
BROMOMETHANE	20.0	21.9	109.5	7.58
CHLOROETHANE	20.0	23.0	115.0	11.98
triCL,Fl-METHANE	20.0	23.1	115.5	5.06
1,1-DICHLOROETHENE	20.0	23.1	115.5	0.86
METHYLENE CHLORIDE	20.0	38.9	143.5	3.55
trans-1,2-DICHLOROETHENE	20.0	21.5	107.5	0.47
1,1-DICHLOROETHANE	20.0	21.9	109.5	1.36
CHLOROFORM	20.0	21.0	104.5	2.91
1,1,1-TRICHLOROETHANE	20.0	21.6	108.0	3.19
CARBON TETRACHLORIDE	20.0	21.6	108.0	3.19
1,2-DICHLOROETHANE	20.0	21.4	107.0	0.94
TRICHLOROETHENE	20.0	21.3	106.5	7.30
1,2-DICHLOROPROPANE	20.0	21.8	109.0	10.63
Br,diCl METHANE	20.0	20.8	104.0	3.92
2-ClETHYL VINYL ETHER	20.0	23.4	117.0	11.29
trans-1,3-DICHLOROPROPENE	20.0	21.6	108.0	7.19
cis-1,3-diCl PROPENE	20.0	21.5	107.5	0.92
1,1,2-TRICHLOROETHANE	20.0	21.7	108.5	0.46
TETRACHLOROETHENE	20.0	22.2	111.0	2.74
diBr,Cl METHANE	20.0	22.4	112.0	4.57
CHLOROBENZENE	20.0	21.5	107.5	0.93
BROMOFORM	20.0	20.6	103.0	3.46
TETRACHLOROETHANE	20.0	22.4	112.0	5.50
1,3-DICHLOROBENZENE	20.0	22.4	112.0	2.26
1,4-DICHLOROBENZENE	20.0	21.9	109.5	1.38
1,2-DICHLOROBENZENE	20.0	20.7	103.5	0.96

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : SOIL
ATAS # : METHOD BLANK
DATE SUBMITTED: 08-12-95
DATE ANALYZED : 08-18-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	1.0	ND
VINYL CHLORIDE	1.0	ND
BROMOMETHANE	1.0	ND
CHLOROETHANE	1.0	ND
triCL,Fl-METHANE	1.0	ND
1,1-DICHLOROETHENE	1.0	ND
METHYLENE CHLORIDE	1.0	1.8
trans-1,2-DICHLOROETHENE	1.0	ND
1,1-DICHLOROETHANE	1.0	ND
CHLOROFORM	1.0	ND
1,1,1-TRICHLOROETHANE	1.0	ND
CARBON TETRACHLORIDE	1.0	ND
1,2-DICHLOROETHANE	1.0	ND
TRICHLOROETHENE	1.0	ND
1,2-DICHLOROPROPANE	1.0	ND
Br,diCl METHANE	1.0	ND
2-ClETHYL VINYL ETHER	1.0	ND
trans-1,3-DICHLOROPROPENE	1.0	ND
cis-1,3-diCl PROPENE	1.0	ND
1,1,2-TRICHLOROETHANE	1.0	ND
TETRACHLOROETHENE	1.0	ND
diBr,Cl METHANE	1.0	ND
CHLOROBENZENE	1.0	ND
BROMOFORM	1.0	ND
TETRACHLOROETHANE	1.0	ND
1,3-DICHLOROBENZENE	1.0	ND
1,4-DICHLOROBENZENE	1.0	ND
1,2-DICHLOROBENZENE	1.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE	(65-135%)	98 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE	(40-140%)	99 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : MATRIX SPIKE
DATE ANALYZED : 08-18-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/Kg)	BLANK SAMPLE CONC. (ug/Kg)	CONTROL MS MATRIX SPIKE CONC. (ug/Kg)	MS PERCENT RECOVERY
CHLOROMETHANE	20.0	ND	20.2	101.0
VINYL CHLORIDE	20.0	ND	21.3	106.5
BROMOMETHANE	20.0	ND	19.8	99.0
CHLOROETHANE	20.0	ND	21.7	108.5
triCL,Fl-METHANE	20.0	0.2	21.8	108.0
1,1-DICHLOROETHENE	20.0	ND	20.2	101.0
METHYLENE CHLORIDE	20.0	1.8	19.2	87.0
trans-1,2-DICHLOROETHENE	20.0	ND	19.1	95.5
1,1-DICHLOROETHANE	20.0	ND	17.7	88.5
CHLOROFORM	20.0	0.2	20.9	103.5
1,1,1-TRICHLOROETHANE	20.0	ND	21.7	108.5
CARBON TETRACHLORIDE	20.0	ND	21.7	108.5
1,2-DICHLOROETHANE	20.0	ND	21.2	106.0
TRICHLOROETHENE	20.0	ND	21.2	106.0
1,2-DICHLOROPROPANE	20.0	ND	21.2	106.0
Br,diCl METHANE	20.0	ND	20.8	104.0
2-ClETHYL VINYL ETHER	20.0	ND	21.8	109.0
trans-1,3-DICHLOROPROPENE	20.0	ND	21.0	105.0
cis-1,3-diCl PROPENE	20.0	ND	21.4	107.0
1,1,2-TRICHLOROETHANE	20.0	ND	21.5	107.5
TETRACHLOROETHENE	20.0	0.1	21.4	106.5
diBr,Cl METHANE	20.0	ND	21.8	109.0
CHLOROBENZENE	20.0	ND	21.3	106.5
BROMOFORM	20.0	ND	21.1	105.5
TETRACHLOROETHANE	20.0	ND	21.8	109.0
1,3-DICHLOROBENZENE	20.0	ND	20.7	103.5
1,4-DICHLOROBENZENE	20.0	ND	21.2	106.0
1,2-DICHLOROBENZENE	20.0	ND	20.7	103.5

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1369101H(231)

DATE : 08-23-95

SAMPLE MATRIX : MATRIX SPIKE DUPLICATE
DATE ANALYZED : 08-18-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/Kg)	CONTROL MSD SPIKE DUP. CONC. (ug/Kg)	MSD PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
CHLOROMETHANE	20.0	19.7	98.5	2.51
VINYL CHLORIDE	20.0	19.2	96.0	10.37
BROMOMETHANE	20.0	20.0	100.0	1.00
CHLOROETHANE	20.0	21.0	105.0	3.28
triCL,Fl-METHANE	20.0	18.0	89.0	19.29
1,1-DICHLOROETHENE	20.0	20.1	100.5	0.50
METHYLENE CHLORIDE	20.0	24.1	111.5	24.68
trans-1,2-DICHLOROETHENE	20.0	22.0	110.0	14.11
1,1-DICHLOROETHANE	20.0	20.3	101.5	13.68
CHLOROFORM	20.0	20.6	102.0	1.46
1,1,1-TRICHLOROETHANE	20.0	21.5	107.5	0.92
CARBON TETRACHLORIDE	20.0	20.1	100.5	7.66
1,2-DICHLOROETHANE	20.0	21.4	107.0	0.94
TRICHLOROETHENE	20.0	20.5	102.5	3.36
1,2-DICHLOROPROPANE	20.0	21.3	106.5	0.47
Br,diCl METHANE	20.0	21.3	106.5	2.38
2-ClETHYL VINYL ETHER	20.0	22.4	112.0	2.71
trans-1,3-DICHLOROPROPENE	20.0	21.5	107.5	2.35
cis-1,3-diCl PROPENE	20.0	21.7	108.5	1.39
1,1,2-TRICHLOROETHANE	20.0	21.6	108.5	0.46
TETRACHLOROETHENE	20.0	20.9	104.0	2.38
diBr,Cl METHANE	20.0	21.7	108.5	0.46
CHLOROBENZENE	20.0	20.9	104.5	1.90
BROMOFORM	20.0	22.2	111.0	5.08
TETRACHLOROETHANE	20.0	23.1	115.5	5.79
1,3-DICHLOROBENZENE	20.0	20.8	104.0	0.48
1,4-DICHLOROBENZENE	20.0	20.9	104.5	1.42
1,2-DICHLOROBENZENE	20.0	21.4	107.0	3.32

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

CHAIN OF CUSTODY RECORD

ATAS Client Name: DAMES & MOORE

Project Name: MODINE

Project #:

Form Completed By: MIESCHE FRANCIS

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: VOC EPA Method 8010	Preservative: Ice	Preservative: Chemical (see below)	Remarks	Lab Use Only: Initials	Lab Use Only: Date	Lab Use Only: Location/Temp
B-13 8½-13	8-8-95	0845	Soil	X		1	X			Standard Turnaround	WP	8-14-95	TU 16C
B-16 6'-4½	8-7-95	1611	Soil	X		1	X						13691.01 02
B-17(mw3) 4½	8½ 8-7	1645	Soil	X		1	X						03

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature:	Signature: WALTER DOTSON	Signature:	Signature:
Printed Name: Miesche Francis	Printed Name: ATAS	Printed Name:	Printed Name:
Firm: DAMES & MOORE	Firm: 8/12/95 0900	Firm:	Firm:
Date/Time: 8/11/95 1030	Date/Time:	Date/Time:	Date/Time:

SEND RESULTS TO (Name & Company): DAN PRICE / DAMES & MOORE

Original to ATAS/Copy to Client

Turnaround Requirements

____ 1 to 2 working days

____ 3 working days

____ 5 working days

____ 10 working days

____ 15 working days

Preservative codes

A - none

B - HNO_3

C - H_2SO_4

D - NaOH

E - HCl

F - ____

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

August 28, 1995

Dan Price
Dames & Moore
2135 East Sunshine
Springfield, MO 65804

RE: ATAS #13714.01-#13714.02
Modine

Dear Mr. Price:

Enclosed are the analytical reports for the samples received in our laboratory on August 8, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/dms

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1371401H(231)

DATE : 08-28-95

SAMPLE MATRIX : WATER
ATAS # : 13714.01
DATE SUBMITTED: 08-08-95
DATE ANALYZED : 08-22-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : MW-1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
trans-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	11.8
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
trans-1,3-DICHLOROPROPENE	5.0	ND
cis-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	108 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	111 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1371401H(231)

DATE : 08-28-95

SAMPLE MATRIX : WATER
ATAS # : 13714.02
DATE SUBMITTED: 08-08-95
DATE ANALYZED : 08-22-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : TRIP BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
trans-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
trans-1,3-DICHLOROPROPENE	5.0	ND
cis-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	99 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	100 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1371401H(231)
DATE : 08-28-95

SAMPLE MATRIX : WATER
ATAS # : METHOD BLANK
DATE SUBMITTED: 08-08-95
DATE ANALYZED : 08-22-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : MODINE
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
trans-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
trans-1,3-DICHLOROPROPENE	5.0	ND
cis-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	110 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	112 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1371401H(231)

DATE : 08-28-95

SAMPLE MATRIX : MATRIX SPIKE
DATE ANALYZED : 08-22-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/L)	CONTROL SAMPLE CONC. (ug/L)	CONTROL MS MATRIX SPIKE CONC. (ug/L)	MS PERCENT RECOVERY
CHLOROMETHANE	20.0	ND	20.6	103.0
VINYL CHLORIDE	20.0	ND	22.4	112.0
BROMOMETHANE	20.0	ND	21.0	105.0
CHLOROETHANE	20.0	ND	23.5	117.5
triCL,Fl-METHANE	20.0	0.2	25.6	127.0
1,1-DICHLOROETHENE	20.0	ND	22.8	114.0
METHYLENE CHLORIDE	20.0	ND	18.0	90.0
trans-1,2-DICHLOROETHENE	20.0	ND	20.6	103.0
1,1-DICHLOROETHANE	20.0	ND	20.0	100.0
CHLOROFORM	20.0	0.2	21.4	106.0
1,1,1-TRICHLOROETHANE	20.0	ND	22.2	111.0
CARBON TETRACHLORIDE	20.0	ND	23.2	116.0
1,2-DICHLOROETHANE	20.0	ND	20.7	103.5
TRICHLOROETHENE	20.0	ND	22.2	111.0
1,2-DICHLOROPROPANE	20.0	ND	21.6	108.0
Br,diCl METHANE	20.0	ND	19.8	99.0
2-ClETHYL VINYL ETHER	20.0	ND	23.4	117.0
trans-1,3-DICHLOROPROPENE	20.0	ND	21.2	106.0
cis-1,3-diCl PROPENE	20.0	ND	20.8	104.0
1,1,2-TRICHLOROETHANE	20.0	ND	21.7	108.5
TETRACHLOROETHENE	20.0	ND	22.9	114.5
diBr,Cl METHANE	20.0	ND	20.6	103.0
CHLOROBENZENE	20.0	ND	21.6	108.0
BROMOFORM	20.0	ND	21.4	107.0
TETRACHLOROETHANE	20.0	ND	20.9	104.5
1,3-DICHLOROBENZENE	20.0	ND	20.1	100.5
1,4-DICHLOROBENZENE	20.0	ND	20.2	101.0
1,2-DICHLOROBENZENE	20.0	ND	20.3	101.5

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1371401H(231)

DATE : 08-28-95

SAMPLE MATRIX : MATRIX SPIKE DUPLICATE
DATE ANALYZED : 08-22-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

COMPOUND	SPIKE CONC (ug/L)	CONTROL MSD SPIKE DUP. CONC. (ug/L)	MSD PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
CHLOROMETHANE	20.0	21.1	105.5	2.40
VINYL CHLORIDE	20.0	22.4	112.0	0.00
BROMOMETHANE	20.0	20.4	102.0	2.90
CHLOROETHANE	20.0	23.4	117.0	0.43
triCL,Fl-METHANE	20.0	25.7	127.5	0.39
1,1-DICHLOROETHENE	20.0	22.9	114.5	0.44
METHYLENE CHLORIDE	20.0	19.0	95.0	5.40
trans-1,2-DICHLOROETHENE	20.0	21.0	105.0	1.92
1,1-DICHLOROETHANE	20.0	20.3	101.5	1.49
CHLOROFORM	20.0	21.3	105.5	0.47
1,1,1-TRICHLOROETHANE	20.0	22.8	114.0	2.67
CARBON TETRACHLORIDE	20.0	23.0	115.0	0.86
1,2-DICHLOROETHANE	20.0	21.4	107.0	3.32
TRICHLOROETHENE	20.0	22.2	111.0	0.00
1,2-DICHLOROPROPANE	20.0	21.9	109.5	1.38
Br,diCl METHANE	20.0	21.0	105.0	5.88
2-ClETHYL VINYL ETHER	20.0	24.5	122.5	4.59
trans-1,3-DICHLOROPROPENE	20.0	21.3	106.5	0.47
cis-1,3-diCl PROPENE	20.0	21.6	108.0	3.77
1,1,2-TRICHLOROETHANE	20.0	22.0	111.0	2.28
TETRACHLOROETHENE	20.0	22.8	114.0	0.44
diBr,Cl METHANE	20.0	21.3	106.5	3.34
CHLOROBENZENE	20.0	21.8	109.0	0.92
BROMOFORM	20.0	22.8	114.0	6.33
TETRACHLOROETHANE	20.0	22.1	110.5	5.58
1,3-DICHLOROBENZENE	20.0	21.6	108.0	7.19
1,4-DICHLOROBENZENE	20.0	21.3	106.5	5.30
1,2-DICHLOROBENZENE	20.0	21.8	109.0	7.12

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

CHAIN OF CUSTODY RECORD

ATAS Client Name: DAMES & MOORE

Project Name: Modine

Project #:

Form Completed By: Miesche Francis

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: VOC's (reporting level of 5ppb for ICE)	Preservative: Ice / Chemical (see below)	Remarks	Lab Use Only: Initials / Date / Location/Temp
MW-1	8-16	1030	WATER	✓		2	✓		STANDARD TURN AROUND	WP 8/18/95 TH 13 1371 4.01
Trip Blank	—	—				1	✓			↓ OK

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: Miesche Francis	Signature:	Signature:	Signature:
Printed Name: Miesche Francis	Printed Name: WALTER DAVIS	Printed Name:	Printed Name:
Firm: DAMES & MOORE	Firm: ATAS	Firm:	Firm:
Date/Time: 8-18-95 / 1245 ~~0900~~	Date/Time: 8-8-95 12:45	Date/Time:	Date/Time:

Turnaround Requirements

___ 1 to 2 working days

___ 3 working days

___ 5 working days

___ 10 working days

___ 15 working days

Preservative codes

A - none

B - HNO_3

C - H_2SO_4

D - NaOH

(E - HCl)

F - ____

SEND RESULTS TO (Name & Company): DAN PRICE / DAMES & MOORE

Original to ATAS/Copy to Client

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

September 6, 1995

Dan Price
Dames & Moore
2135 E Sunshine Street, Suite 105
Springfield, MO 65804

RE: ATAS #13733.01-#13733.07
#27397 - Modine

Dear Mr. Price:

Enclosed are the analytical reports for the samples received in our laboratory on August 24, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/pck

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373306HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.06
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : MW-2

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE(65-135%)		83 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		82 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373304HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.04
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : DUP-1

Duplicate of MW-2

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE(65-135%)		80 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		82 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373307HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.07
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : MW-3

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	8.0
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE	(65-135%)	87 %
SURROGATE RECOVERY: p-CHLOROTOLUENE	(40-140%)	86 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373302HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.02
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : MW-4

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	88.9
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE	(65-135%)	85 %
SURROGATE RECOVERY: p-CHLOROTOLUENE	(40-140%)	79 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373305HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.05
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-29-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : TRIP BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE (65-135%)		90 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		88 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373303HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : 13733.03
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : EB-2

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE(65-135%)		102 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		97 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373301HV(221)

DATE : 09-06-95

SAMPLE MATRIX : SOIL
ATAS # : 13733.01
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-29-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : MW-3

RESULTS REPORTED IN ug/Kg OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/Kg)	AMOUNT FOUND (ug/Kg)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	23.8
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE(65-135%)		95 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		91 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = COMPOUND ALSO FOUND IN BLANK

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373308HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : METHOD BLANK
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-29-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND
SURROGATE RECOVERY: cis1,2 DICHLOROETHENE(65-135%)		87 %
SURROGATE RECOVERY: p-CHLOROTOLUENE (40-140%)		88 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

SAMPLE MATRIX : WATER
DATE ANALYZED : 08-29-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

REPORT DATE: 09-06-95

CONTROL SPIKE

COMPOUND	SPIKE CONC (ug/L)	CONTROL SAMPLE CONC. (ug/L)	CONTROL MS MATRIX SPIKE CONC. (ug/L)	MS PERCENT RECOVERY
CHLOROMETHANE	20.0	ND	18.4	92.0
VINYL CHLORIDE	20.0	ND	22.2	111.0
BROMOMETHANE	20.0	ND	21.1	105.5
CHLOROETHANE	20.0	ND	22.0	110.0
triCL,Fl-METHANE	20.0	ND	22.0	110.0
1,1-DICHLOROETHENE	20.0	ND	21.8	109.0
METHYLENE CHLORIDE	20.0	0.2	20.9	103.5
t-1,2-DICHLOROETHENE	20.0	ND	22.3	111.5
1,1-DICHLOROETHANE	20.0	ND	21.8	109.0
CHLOROFORM	20.0	0.1	21.1	105.0
1,1,1-TRICHLOROETHANE	20.0	ND	22.8	114.0
CARBON TETRACHLORIDE	20.0	ND	23.3	116.5
1,2-DICHLOROETHANE	20.0	ND	22.2	111.0
TRICHLOROETHENE	20.0	ND	22.0	110.0
1,2-DICHLOROPROPANE	20.0	ND	22.1	110.5
Br,diCl METHANE	20.0	ND	20.5	102.5
2-ClETHYL VINYL ETHER	20.0	ND	26.6	133.0
c-1,3-DICHLOROPROPENE	20.0	ND	22.2	111.0
t-1,3-diCl PROPENE	20.0	ND	21.2	106.0
1,1,2-TRICHLOROETHANE	20.0	ND	21.5	107.5
TETRACHLOROETHENE	20.0	ND	21.6	108.0
diBr,Cl METHANE	20.0	ND	21.2	106.0
CHLOROBENZENE	20.0	ND	20.1	100.3
BROMOFORM	20.0	ND	20.9	104.5
TETRACHLOROETHANE	20.0	ND	21.2	106.0
1,3-DICHLOROBENZENE	20.0	ND	19.6	98.0
1,4-DICHLOROBENZENE	20.0	ND	20.3	101.5
1,2-DICHLOROBENZENE	20.0	ND	19.0	95.0

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

SAMPLE MATRIX : WATER
DATE ANALYZED : 08-29-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

REPORT DATE: 09-06-95

CONTROL SPIKE DUPLICATE

COMPOUND	SPIKE CONC (ug/L)	CONTROL MSD SPIKE DUP. CONC.(ug/L)	MSD PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
CHLOROMETHANE	20.0	18.1	90.5	1.64
VINYL CHLORIDE	20.0	21.1	105.5	5.08
BROMOMETHANE	20.0	20.9	104.5	0.95
CHLOROETHANE	20.0	20.8	104.0	5.61
triCL,Fl-METHANE	20.0	21.9	109.5	0.46
1,1-DICHLOROETHENE	20.0	20.9	104.5	4.22
METHYLENE CHLORIDE	20.0	20.1	99.5	3.94
t-1,2-DICHLOROETHENE	20.0	21.4	107.0	4.12
1,1-DICHLOROETHANE	20.0	21.3	106.5	2.32
CHLOROFORM	20.0	20.3	101.0	3.88
1,1,1-TRICHLOROETHANE	20.0	20.7	103.5	9.66
CARBON TETRACHLORIDE	20.0	23.1	115.5	0.86
1,2-DICHLOROETHANE	20.0	22.3	111.5	0.45
TRICHLOROETHENE	20.0	23.3	116.5	5.74
1,2-DICHLOROPROPANE	20.0	23.3	116.5	5.29
Br,diCl METHANE	20.0	21.3	106.5	3.83
2-ClETHYL VINYL ETHER	20.0	26.4	132.0	0.75
c-1,3-DICHLOROPROPENE	20.0	21.7	108.5	2.28
t-1,3-diCl PROPENE	20.0	21.3	106.5	0.47
1,1,2-TRICHLOROETHANE	20.0	21.0	105.0	2.35
TETRACHLOROETHENE	20.0	20.6	103.0	4.74
diBr,Cl METHANE	20.0	21.1	105.5	0.47
CHLOROBENZENE	20.0	18.7	93.5	7.22
BROMOFORM	20.0	22.4	112.0	6.93
TETRACHLOROETHANE	20.0	23.0	115.0	8.14
1,3-DICHLOROBENZENE	20.0	20.1	100.5	2.32
1,4-DICHLOROBENZENE	20.0	20.6	103.0	1.47
1,2-DICHLOROBENZENE	20.0	19.3	96.5	1.57

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373308HV(221)

DATE : 09-06-95

SAMPLE MATRIX : WATER
ATAS # : METHOD BLANK
DATE SUBMITTED: 08-24-95
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397 - MODINE
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
c-1,3-DICHLOROPROPENE	5.0	ND
t-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE	(65-135%)	74 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE	(40-140%)	87 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

SAMPLE MATRIX : WATER
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

REPORT DATE: 09-06-95

MATRIX SPIKE

COMPOUND	SPIKE CONC (ug/L)	13733.03 SAMPLE CONC. (ug/L)	13733.03 MS MATRIX SPIKE CONC. (ug/L)	MS PERCENT RECOVERY
CHLOROMETHANE	20.0	ND	19.6	98.0
VINYL CHLORIDE	20.0	ND	19.7	98.5
BROMOMETHANE	20.0	ND	20.8	104.0
CHLOROETHANE	20.0	ND	21.3	106.5
triCL,Fl-METHANE	20.0	0.2	21.3	105.5
1,1-DICHLOROETHENE	20.0	ND	21.0	105.0
METHYLENE CHLORIDE	20.0	1.3	21.7	102.0
t-1,2-DICHLOROETHENE	20.0	ND	20.3	101.5
1,1-DICHLOROETHANE	20.0	ND	20.3	101.5
CHLOROFORM	20.0	3.2	21.8	93.0
1,1,1-TRICHLOROETHANE	20.0	ND	20.1	100.5
CARBON TETRACHLORIDE	20.0	ND	20.4	102.0
1,2-DICHLOROETHANE	20.0	ND	20.4	102.0
TRICHLOROETHENE	20.0	ND	19.8	99.0
1,2-DICHLOROPROPANE	20.0	ND	20.5	102.5
Br,diCl METHANE	20.0	1.3	20.2	94.5
2-ClETHYL VINYL ETHER	20.0	ND	8.5	42.5
c-1,3-DICHLOROPROPENE	20.0	ND	18.5	92.5
t-1,3-diCl PROPENE	20.0	ND	19.4	97.0
1,1,2-TRICHLOROETHANE	20.0	ND	21.1	105.5
TETRACHLOROETHENE	20.0	0.1	20.4	101.5
diBr,Cl METHANE	20.0	0.9	19.2	91.5
CHLOROBENZENE	20.0	ND	18.6	93.0
BROMOFORM	20.0	ND	17.8	89.0
TETRACHLOROETHANE	20.0	ND	18.8	94.0
1,3-DICHLOROBENZENE	20.0	ND	18.1	90.5
1,4-DICHLOROBENZENE	20.0	ND	17.8	89.0
1,2-DICHLOROBENZENE	20.0	ND	19.6	98.0

ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

SAMPLE MATRIX : WATER
DATE ANALYZED : 08-30-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

REPORT DATE: 09-06-95

MATRIX SPIKE DUPLICATE

COMPOUND	SPIKE CONC (ug/L)	13733.03 MSD SPIKE DUP. CONC.(ug/L)	MSD PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
CHLOROMETHANE	20.0	18.7	93.5	4.70
VINYL CHLORIDE	20.0	19.7	98.5	0.00
BROMOMETHANE	20.0	18.8	94.0	10.10
CHLOROETHANE	20.0	19.9	99.5	6.80
triCL,Fl-METHANE	20.0	19.4	96.0	9.43
1,1-DICHLOROETHENE	20.0	19.2	96.0	8.96
METHYLENE CHLORIDE	20.0	20.5	96.0	6.06
t-1,2-DICHLOROETHENE	20.0	20.1	100.5	0.99
1,1-DICHLOROETHANE	20.0	19.8	99.0	2.49
CHLOROFORM	20.0	23.4	101.0	8.25
1,1,1-TRICHLOROETHANE	20.0	20.6	103.0	2.46
CARBON TETRACHLORIDE	20.0	19.9	99.3	2.48
1,2-DICHLOROETHANE	20.0	20.9	104.5	2.42
TRICHLOROETHENE	20.0	19.8	99.0	0.00
1,2-DICHLOROPROPANE	20.0	20.0	100.0	2.47
Br,diCl METHANE	20.0	21.4	100.5	6.15
2-ClETHYL VINYL ETHER	20.0	2.4	12.0	111.93
c-1,3-DICHLOROPROPENE	20.0	20.0	100.0	7.79
t-1,3-diCl PROPENE	20.0	20.7	103.3	6.48
1,1,2-TRICHLOROETHANE	20.0	20.0	100.0	6.35
TETRACHLOROETHENE	20.0	20.3	101.0	0.49
diBr,Cl METHANE	20.0	19.7	94.0	2.70
CHLOROBENZENE	20.0	20.2	101.0	8.25
BROMOFORM	20.0	20.0	100.0	11.64
TETRACHLOROETHANE	20.0	19.2	96.0	2.10
1,3-DICHLOROBENZENE	20.0	21.4	107.0	16.71
1,4-DICHLOROBENZENE	20.0	21.4	107.0	18.37
1,2-DICHLOROBENZENE	20.0	21.0	105.0	6.90

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373301MT(221)
DATE : 09-06-95

SAMPLE MATRIX : SOIL
ATAS # : 13733.01
DATE SUBMITTED: 08-24-95
PROJECT : #27397 - MODINE
SAMPLE ID : MW-3

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			METALS		
ARSENIC	1.00	mg/Kg	4.35	09-06-95	SW 6010
BARIUM	0.40	mg/Kg	31.3	09-06-95	SW 6010
CADMIUM	0.10	mg/Kg	0.372	09-06-95	SW 6010
CHROMIUM	0.10	mg/Kg	4.50	09-06-95	SW 6010
LEAD	1.00	mg/Kg	84.1	09-06-95	SW 6010
SILVER	0.20	mg/Kg	ND	09-06-95	SW 6010
SELENIUM	2.00	mg/Kg	ND	09-06-95	SW 6010
MERCURY	0.20	mg/Kg	ND	08-30-95	SW 7470

mg/Kg = PARTS PER MILLION(PPM)
ND = NOT DETECTED ABOVE REPORTING LIMIT

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 E SUNSHINE STREET, SUITE 105
SPRINGFIELD, MO 65804
ATTN: DAN PRICE

REPORT: 1373308MT(221)

DATE : 09-06-95

QA/QC

DESCRIPTION		PARAMETER	RESULTS	
METHOD BLANK	09-06-95	ARSENIC	<1.00	mg/Kg
METHOD BLANK	09-06-95	BARIUM	<0.40	mg/Kg
METHOD BLANK	09-06-95	CADMIUM	<0.10	mg/Kg
METHOD BLANK	09-06-95	CHROMIUM	<0.10	mg/Kg
METHOD BLANK	09-06-95	LEAD	<1.00	mg/Kg
METHOD BLANK	09-06-95	SILVER	<0.20	mg/Kg
METHOD BLANK	09-06-95	SELENIUM	<2.00	mg/Kg
METHOD BLANK	08-30-95	MERCURY	<0.20	mg/Kg
BLANK SPIKE	09-06-95	ARSENIC	100 %	RECOVERY
BLANK SPIKE	09-06-95	BARIUM	100 %	RECOVERY
BLANK SPIKE	09-06-95	CADMIUM	97 %	RECOVERY
BLANK SPIKE	09-06-95	CHROMIUM	99 %	RECOVERY
BLANK SPIKE	09-06-95	LEAD	102 %	RECOVERY
BLANK SPIKE	09-06-95	SILVER	100 %	RECOVERY
BLANK SPIKE	09-06-95	SELENIUM	99 %	RECOVERY
BLANK SPIKE	08-30-95	MERCURY	91 %	RECOVERY

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

PAGE ____ OF ____

CHAIN OF CUSTODY RECORD

ATAS Client Name: Dames & Moore

Project Name: Modine

Project #: 27397

Form Completed By: Miesche Francis

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: Total RCRA Metals	VOCs method 8010	VOCs (Reporting level 5 ppb for TCE)	Preservative: Ice / Chemical (see below)	Remarks	Lab Use Only: Initials LM; Date 8-24-95; Location/Temp IA6-TH 4°
MW-3	8-22	1622	Soil	X		1	X	X			May need more analysis on soil for MW3 Standard turn around time	13733.01
MW-4	8-22	1045	Water	X		2			X			02
EB-2	8-22	1837	Water	X		2			X			03
DUP-1	8-22	1840	Water	X		2			X			04
Trip Blank						1			X			05
MW-2	8-22	1840	Water	X		2			X			06
MW-3	8-22	1754	Water	X		2			X			07

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: Miesche Francis	Signature: WALTER DOTSON	Signature:	Signature:
Printed Name: Dames & Moore	Printed Name: ATAS	Printed Name:	Printed Name:
Firm: 8-23-95 1205	Firm: 8/24/95 0935	Firm:	Firm:
Date/Time	Date/Time	Date/Time	Date/Time

SEND RESULTS TO (Name & Company): DAN Price Dames & Moore.

Original to ATAS/Copy to Client

Turnaround Requirements

____ 1 to 2 working days

____ 3 working days

____ 5 working days

✓ 10 working days

____ 15 working days

Preservative codes

A - none

B - HNO_3

C - H_2SO_4

D - NaOH

E - HCl VOCs

F - ____

AMERICAN TECHNICAL & ANALYTICAL SERVICES, INC.

875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 • FAX (314) 434-0080

November 30, 1995

Miesche Francis
Dames & Moore
2135 East Sunshine - Suite 105
Springfield, MO 65804

RE: ATAS #14300.01-#14300.06
#27397-005-045 - MODINE TSD

Dear Ms. Francis:

Enclosed are the analytical reports for the samples received in our laboratory on November 17, 1995.

If, in your review, you should have any questions or require additional information, please call.

Thank you for choosing ATAS for your analytical needs.

Sincerely,

Jeffrey A. Carr
Project Manager

Enclosures

JAC/dms

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)
DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.01
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : TRIP BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	90 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	100 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)

DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.06
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : MW-1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	9.4
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	92 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	97 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)
DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.04
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : MW-2

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	92 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	100 %

J = ESTIMATED VALUE BELOW REPORTING LIMIT
* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)
DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.03
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : MW-3

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	ND
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	97 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	105 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)

DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.02
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : MW-4

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	142
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	93 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	97 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)

DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : 14300.05
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : DUP-1

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	5.0	ND
VINYL CHLORIDE	5.0	ND
BROMOMETHANE	5.0	ND
CHLOROETHANE	5.0	ND
triCL,Fl-METHANE	5.0	ND
1,1-DICHLOROETHENE	5.0	ND
METHYLENE CHLORIDE	5.0	ND
t-1,2-DICHLOROETHENE	5.0	ND
1,1-DICHLOROETHANE	5.0	ND
CHLOROFORM	5.0	ND
1,1,1-TRICHLOROETHANE	5.0	ND
CARBON TETRACHLORIDE	5.0	ND
1,2-DICHLOROETHANE	5.0	ND
TRICHLOROETHENE	5.0	154
1,2-DICHLOROPROPANE	5.0	ND
Br,diCl METHANE	5.0	ND
2-ClETHYL VINYL ETHER	5.0	ND
t-1,3-DICHLOROPROPENE	5.0	ND
c-1,3-diCl PROPENE	5.0	ND
1,1,2-TRICHLOROETHANE	5.0	ND
TETRACHLOROETHENE	5.0	ND
diBr,Cl METHANE	5.0	ND
CHLOROBENZENE	5.0	ND
BROMOFORM	5.0	ND
TETRACHLOROETHANE	5.0	ND
1,3-DICHLOROBENZENE	5.0	ND
1,4-DICHLOROBENZENE	5.0	ND
1,2-DICHLOROBENZENE	5.0	ND

SURROGATE RECOVERY:	2-BROMO-1-CHLOROPROPANE(65-35%)	91 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	100 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

CLIENT: DAMES & MOORE
2135 EAST SUNSHINE - SUITE 105
SPRINGFIELD, MO 65804
ATTN: MIESCHE FRANCIS

REPORT: 1430001H(233)

DATE : 11-29-95

SAMPLE MATRIX : WATER
ATAS # : METHOD BLANK
DATE SUBMITTED: 11-17-95
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY
PROJECT : #27397-005-045 - MODINE TSD
SAMPLE ID : METHOD BLANK

RESULTS REPORTED IN ug/L OR PARTS PER BILLION(PPB)

COMPOUND	REPORTING LIMIT (ug/L)	AMOUNT FOUND (ug/L)
CHLOROMETHANE	1.0	ND
VINYL CHLORIDE	1.0	ND
BROMOMETHANE	1.0	ND
CHLOROETHANE	1.0	ND
triCL,Fl-METHANE	1.0	ND
1,1-DICHLOROETHENE	1.0	ND
METHYLENE CHLORIDE	1.0	ND
t-1,2-DICHLOROETHENE	1.0	ND
1,1-DICHLOROETHANE	1.0	ND
CHLOROFORM	1.0	ND
1,1,1-TRICHLOROETHANE	1.0	ND
CARBON TETRACHLORIDE	1.0	ND
1,2-DICHLOROETHANE	1.0	ND
TRICHLOROETHENE	1.0	ND
1,2-DICHLOROPROPANE	1.0	ND
Br,diCl METHANE	1.0	ND
2-ClETHYL VINYL ETHER	1.0	ND
t-1,3-DICHLOROPROPENE	1.0	ND
c-1,3-diCl PROPENE	1.0	ND
1,1,2-TRICHLOROETHANE	1.0	ND
TETRACHLOROETHENE	1.0	ND
diBr,Cl METHANE	1.0	ND
CHLOROBENZENE	1.0	ND
BROMOFORM	1.0	ND
TETRACHLOROETHANE	1.0	ND
1,3-DICHLOROBENZENE	1.0	ND
1,4-DICHLOROBENZENE	1.0	ND
1,2-DICHLOROBENZENE	1.0	ND

SURROGATE RECOVERY:	cis1,2 DICHLOROETHENE(65-135%)	92 %
SURROGATE RECOVERY:	p-CHLOROTOLUENE (40-140%)	104 %

* = OUTSIDE OF QC LIMITS ON BOTH ORIGINAL AND RERUN
ND = NOT DETECTED ABOVE REPORTING LIMIT
B = ANALYTE DETECTED IN METHOD BLANK POSSIBLY BELOW THE REPORTING LIMIT.

ATAS 875 Fee Fee Road • Maryland Heights, MO 63043 • (314) 434-4570 - FAX (314) 434-0080

LABORATORY QUALITY CONTROL SEQUENCE

SAMPLE MATRIX : WATER
DATE ANALYZED : 11-21-95
METHOD REF. : SW846-8010, EPA METHODOLOGY

REPORT DATE: 11-29-95

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

COMPOUND	11590.15 MS PERCENT RECOVERY	11590.15 MSD PERCENT RECOVERY	RELATIVE PERCENT DIFFERENCE
CHLOROMETHANE	91.0	88.5	2.78
VINYL CHLORIDE	81.0	88.0	8.28
BROMOMETHANE	78.0	82.0	5.00
CHLOROETHANE	82.0	91.0	10.40
triCL,Fl-METHANE	92.5	95.0	2.67
1,1-DICHLOROETHENE	98.0	102.5	4.49
METHYLENE CHLORIDE	97.0	97.5	0.51
t-1,2-DICHLOROETHENE	99.5	99.5	0.00
1,1-DICHLOROETHANE	100.5	98.5	2.01
CHLOROFORM	98.0	98.0	0.00
1,1,1-TRICHLOROETHANE	105.0	97.5	7.41
CARBON TETRACHLORIDE	101.5	101.5	0.00
1,2-DICHLOROETHANE	101.5	99.0	2.49
TRICHLOROETHENE	99.5	102.0	2.48
1,2-DICHLOROPROPANE	98.0	98.5	0.51
Br,diCl METHANE	97.5	100.0	2.53
2-ClETHYL VINYL ETHER	43.0	13.0	107.14
c-1,3-DICHLOROPROPENE	100.5	99.0	1.50
t-1,3-diCl PROPENE	96.5	98.0	1.54
1,1,2-TRICHLOROETHANE	100.0	103.5	3.44
TETRACHLOROETHENE	99.0	104.5	5.40
diBr,Cl METHANE	91.5	92.0	0.54
CHLOROBENZENE	94.5	99.5	5.15
BROMOFORM	94.0	94.5	0.53
TETRACHLOROETHANE	93.5	91.5	2.16
1,3-DICHLOROBENZENE	95.0	100.0	5.13
1,4-DICHLOROBENZENE	95.5	98.5	3.09
1,2-DICHLOROBENZENE	95.5	97.0	1.56

ATAS

AMERICAN TECHNICAL & ANALYTICAL SERVICES, Inc.

875 Fee Fee Road • Maryland Heights, MO 63043-3211 • Office (314) 434-4570 • FAX (314) 434-0080

CHAIN OF CUSTODY RECORD

ATAS Client Name: Miesche Francis Dames & Moore

Project Name: Modine TSD

Project #: 27397-005-045

Form Completed By: M. F.

PO #:

Sample ID	Sample Date	Sample Time	Sample Matrix	Grab	Comp	No. of Containers	Type of Analysis: VOCs (8010)	Remarks	Lab Use Only
Trip Blank	11-9-95	1405	Water	✓		1	X	Reporting level for TCE – 5ppb.	14300.01
MW-4	11-15-95	1525	Water	✓		2	X		02
MW-3	11-15-95	1630	Water	✓		2	X		03
MW-2	11-15-95	1745	Water	✓		2	X		04
DUP-1	11-15-95	1520	Water	✓		2	X		05
MW-1	11-15-95	1416	Water	✓		2	X		06

Preservative: Ice, Chemical (see below)

Lab Use Only: Initials: WP; Date: 11-17-95; Location/Temp: TULSA 1°C

Relinquished by:	Received by:	Relinquished by:	Received by:
Signature: Miesche Francis	Signature: WALTER DOTSON	Signature:	Signature:
Printed Name: Miesche Francis	Printed Name: ATAS	Printed Name:	Printed Name:
Firm: Dames & Moore	Firm: ATAS	Firm:	Firm:
Date/Time: 11-16-95 / 1100	Date/Time: 11/17/95 0930	Date/Time:	Date/Time:

Turnaround Requirements

- ___ 1 to 2 working days
- ___ 3 working days
- ___ 5 working days
- X 10 working days
- ___ 15 working days

Preservative codes

- A - none
- B - HNO_3
- C - H_2SO_4
- D - NaOH
- E - HCl
- F - ___

METHOD AND TAT PER M. FRANCIS. JC 11/17/95

SEND RESULTS TO (Name & Company): _____

Original to ATAS/Copy to Client